The IRON AGE

October 15, 1959 A Chilton Publication The National Metalworking Weekly

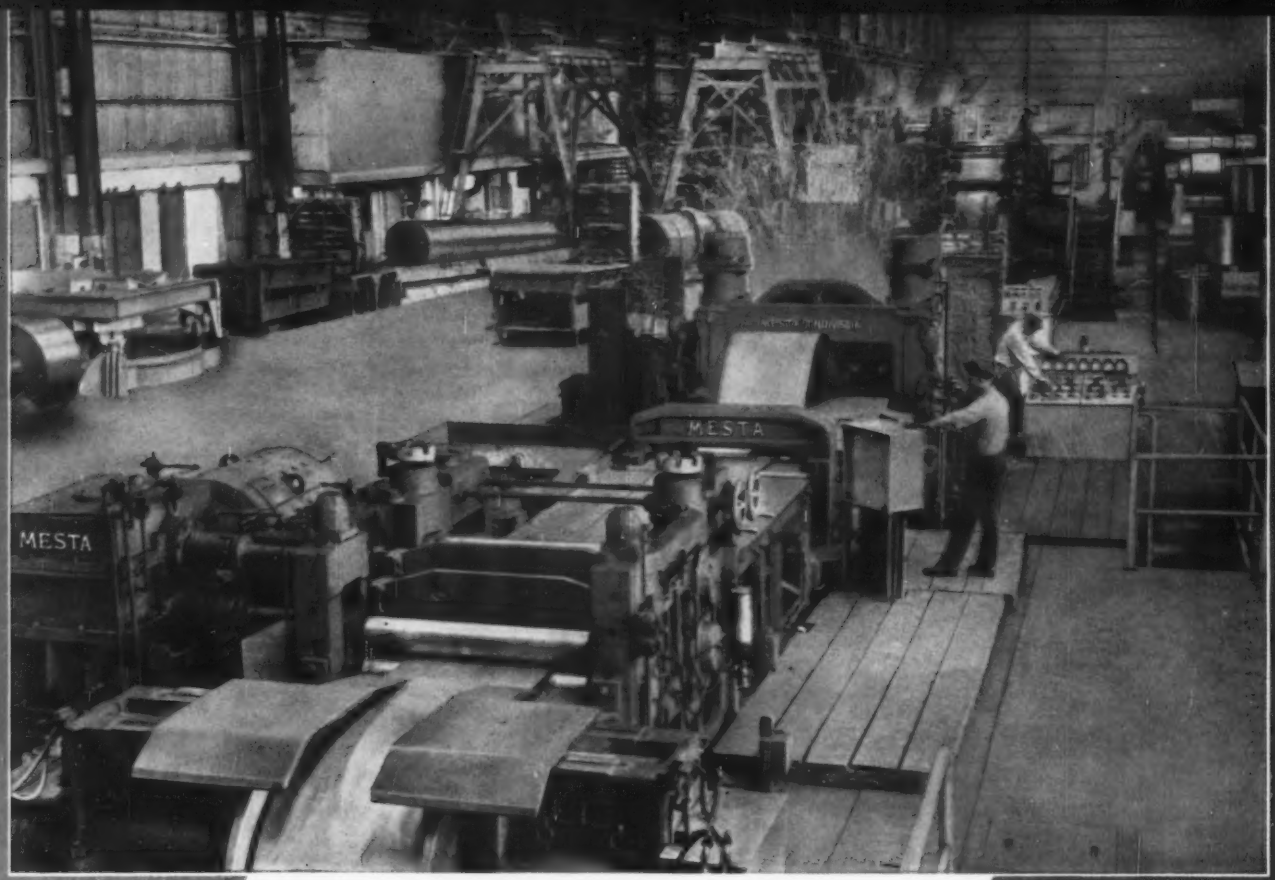
AMF's Morehead Patterson—

Where to Start Planning Company Growth — P. 75

The Full Effects Of the Steel Strike — P. 61

Report New Plastic Coating Process — P. 101

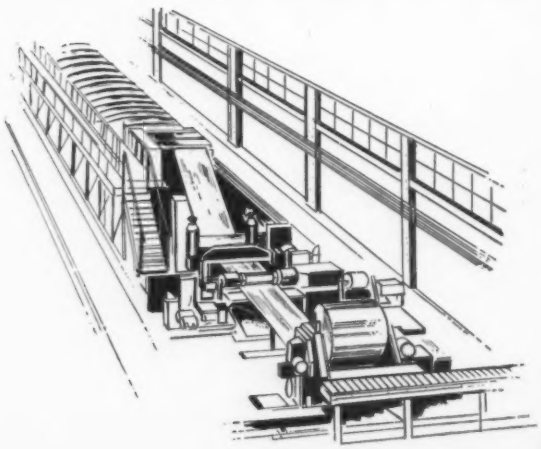
Digest of the Week — P. 2-3



MESTA 48" Continuous Pickling Line with Primary and Secondary Processors, Flash Welder, Up-Cut Shears, Side Trimmer and Up-Coiler.

Continuous PICKLING LINES

DESIGNED AND BUILT BY MESTA



Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

III

KNOW YOUR ALLOY STEELS . . .

This is the third of a series of advertisements dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many in this field, including men of broad experience who may find it useful to review fundamentals from time to time.

What Does Grain Size Mean In An Alloy Steel?

The grain size of alloy steels is generally understood to mean austenite or inherent grain size, as indicated by the McQuaid-Ehn carburizing test. Austenite grain size should be distinguished from ferrite grain size, which is the size of the grains in the as-rolled or as-forged condition with the exception of those steels that are austenitic at room temperature. When steel is heated through the critical range (approximately 1350 to 1600 deg F for most steels, depending on the composition), transformation to austenite takes place. The austenite grains are extremely small when first formed, but grow in size as the temperature above the critical range is increased, and, to a limited extent, as the time is increased. It is apparent, therefore, that both time and temperature must be constant in order to obtain reproducible results.

When temperatures are raised materially above the critical range, different steels show wide variations in grain size, depending on the chemical composition and the deoxidation practice used in making the heat. Heats are customarily deoxidized with aluminum, ferrosilicon, or a combination of deoxidizing elements. Steels using aluminum or other deoxidizers in carefully controlled amounts maintain a slow rate of grain growth at 1700 deg F, while heats finished with other deoxidizers, usually ferrosilicon, develop relatively large austenite grain size at temperatures somewhat below 1700 deg F.

The McQuaid-Ehn test is the one ordinarily used for determining grain size. Steel is rated with a set of eight ASTM charts that are compared one at a time with a specially prepared steel sample until one is found to match. Number 1 grain size, the coarsest, shows 1½ grains per sq in. of steel area examined at 100 diameters magnification. The finest chart is Number 8, which shows 96 or more grains per sq in. at the same magnification.

Properties Affected by Grain Size

Fine-grain steels (grain sizes 5, 6, 7, and 8) do not harden as deeply as coarse-grain steels, and they have less tendency to crack during heat-treatment. Fine-grain steels exhibit greater toughness and shock-resistance—properties that make them suitable for applications involving moving loads and high impact. Practically all alloy steels are produced with fine-grain structures.

Coarse-grain steels exhibit definite machining superiority. For this reason a few parts which are intricately machined are made to coarse-grain practice.

The correct specification and determination of grain structure in steel is a subject that has been given long study by Bethlehem metallurgists. If you would like suggestions on this or any other problem concerning alloy steels, these men will be glad to give you all possible help.

In addition to the entire range of AISI alloy steels, Bethlehem produces special-analysis steels and the full range of carbon grades.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

THE IRON AGE
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The IRON AGE

October 15, 1959—Vol. 184, No. 16

Digest of the Week in

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NEWS ARTICLES

STEEL LABOR

Strike Impact — Effects of the steel strike will linger for months in the steel market. But the impact on

labor relations may last for years. A Taft-Hartley injunction can have little effect on final outcome of negotiations. P. 61

RIGHT TO MANAGE

Discussed by Experts — Companies must be run by management, not unions, or eventually go under. If rights have been lost, they must be regained, even if it means taking strikes. P. 63

TELEVISION

Wide Range—The Government turned to closed-circuit TV to get higher auction prices for surplus goods. P. 64

TRAFFIC PROBLEMS

Solved by TV? — Starting next summer, Detroit will start using tel-

Metalworking

◀ COVER FEATURE

FUTURE PLANNING: Charting a company's growth can't be done by slide rule. It takes management experience too. Morehead Patterson, chairman of American Machine & Foundry, gives some general rules to follow in future planning. P. 75

evision to control traffic on its expressways. P. 79

COMPULSORY MEDIATION

New Law Proposed—Sen. Wiley proposes compulsory mediation for strikes involving basic industries. If it should go through, industry stands to be the probable loser, precedent shows. P. 83

FEATURE ARTICLES

DECORATIVE FILM

In Continuous Coils — A new method takes any pattern that can be photographed, then bonds the plastic decoration to continuous strips of steel. A boon to the appliance industry, bonded coils will undergo the same forming operations as uncoated steel. Present production is in 32-in. widths. P. 101

DIECAST SMALL PARTS

In One Shot—A special diecasting method may solve the problems involved in casting small, intricate parts. This new automatic process is handling zinc-alloy products in single shots. High-volume production of common, moving-part types is the main area of use. P. 104

CERAMIC TOOLS

Carry the Ball — Ceramics are starting to give tungsten carbide a run for its money. Aside from doing some of the tougher jobs that carbides can't take on, ceramics hold great promise for the future. No material will provide finer finishes. P. 106

LIGHT METAL REAMING

With Pressure - Coolant Tools—The reaming of cored holes in diecastings and other aluminum parts is a natural for pressure-coolant tools. These tools are capable of producing precision holes from rough cores in one pass. P. 110

YOUR PRESS SHOP

How to Rate It—Running an inplant press department is often expensive. It pays to know how to keep ahead of mounting costs in stamping production. P. 112

MARKETS & PRICES

ALUMINUM MARKET

Cryogenics—Aluminum producers figure to increase their sales for ultra-low temperature applications by about 1000 pct by 1965. They seem to have the inside track in the market. P. 65

CURTAIN WALL

More Industrial Use—With industrial building strong, curtain wall fabricators are getting a bigger share of the market. Porcelain enameled steel is most popular type of construction. P. 66

STEEL SUMMARY

Crisis Is Here — Invoking the Taft-Hartley Act can't head off the worst steel shortage in years. All it can do is prevent the nation from running completely out of steel. Layoffs will continue to mount as production cutbacks spread. P. 135

PURCHASING

Job Ahead—Steel buyers must consolidate positions with established suppliers if they expect to get sufficient quantities of steel after the strike's end, says a Pittsburgh buyer for a large independent warehouse. P. 136

NEXT WEEK

COATED METALS

For Industry — "How to Get More for Your Coated Metals Dollar," the subject of next week's technical feature, will include types of coatings, uses, properties, forming methods, and assembly.

For FASTER CUT-OFF SAWING at the LOWEST COST-PER-CUT

the

ALL NEW

Milband

BAND SAW MACHINE TOOL

- FAST CUTTING WITH EXTREME ACCURACY
- NARROWER KERF MEANS REDUCED CHIP LOSS
- MINIMUM BLADE STRESS, MUCH LONGER BLADE LIFE
- CUTS ARE CONSISTENTLY STRAIGHT, SMOOTH, ACCURATE

ADVANCED DESIGN

- RUGGED CONSTRUCTION WITH RIGID, OVERSIZED BLADE WHEELS
- FULLY AUTOMATIC OPERATION
- WIDE RANGE OF INFINITELY VARIABLE BLADE SPEEDS
- CONVENIENT, CENTRALIZED CONTROLS
- FAST-ACTING HYDRAULIC VISE
- RECIRCULATING COOLANT SYSTEM

The Blade Behind the Machine

. . . is the MILFORD REZISTOR High Speed Steel Band Saw Blade. Ideal team-mate for the MILBAND Machine Tool, this blade is made from red-hardness steel, outlasts ordinary carbon steel blades many times, and production-saws stainless steel and other tough alloys these blades cannot cut.

SPECIFICATIONS

Blade Speed Range	40 to 360 fpm, infinitely variable
Blade Feed	hydraulic, with compensating flow for work section variations
Motor	3 hp drip-proof with oil-tight push button controls
Blade Guides	carbide, individually adjustable
Blade Tensioning	hydraulic, with tension maintained automatically
Work Receiving Table	25½" x 26½"
Machine Dimensions:	
Width, Including Vise Guard	43½"
Length	93"
Height, Head Down	55"
Height, Head Raised	65"
Bar Feed Dimensions:	
Width, Including Vise	49½"
Length	73"
Weight of Machine and Bar Feed	3000 pounds
Blade Type and Size	MILFORD REZISTOR High Speed Steel Band Saw Blade, 1" x 15'

HACK • HOLE SAWS • SAW & BAND SAW BLADES • STOCK • GROUND FLAT

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Saw Specialists For Over 80 Years

The HENRY G. THOMPSON & SON CO.

MACHINE TOOL DIVISION • 278 CHAPEL ST., NEW HAVEN 5, CONNECTICUT

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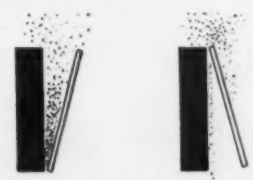
enough dirt to stop an ordinary D-C magnetic brake

Clark's exclusive design feature, magnet hinged at the top, gives the Clark D-C Magnetic Brake an important advantage over ordinary magnetic brakes where the magnet literally forms a wedge-shaped dirt trap.

From the diagrams at right you can see for yourself how important this difference can be for dependable, maintenance-free brake operation in dust and dirt saturated mills and industrial plants.



ORDINARY BRAKE

CLARK BRAKE

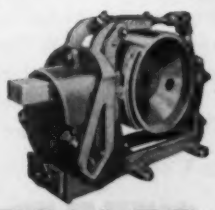
In the Clark Brake, because the widest part of the gap between magnet and armature is at the bottom, any dirt which does get through the smaller gap at the top falls through harmlessly.

Not so with an ordinary brake. Here, because the widest part of the gap between magnet and armature is at the top, dirt not only has easier access into the magnet gap and linkages but it is more likely to pack at these points. When this happens the brake's operation stops . . . production comes to a halt.

And you won't find the operating linkage and adjusting mechanism on the Clark D-C Magnetic Brake buried down in the frame and under the wheel as with ordinary D-C brakes. It's at the top — away from ankle-high dirt in mills and plants—where it is openly accessible for easy inspection and quick adjustment when required.

For more details on the extraordinary Clark D-C Magnetic Brake see your nearest Clark Controller sales representative. Or write direct to Clark Controller.

9M151



The CLARK CONTROLLER Company

Everything Under Control • 1146 E. 152nd St. • Cleveland 10, Ohio

IN CANADA: CANADIAN CONTROLLERS, LIMITED • MAIN OFFICES AND PLANT, TORONTO

PHOTO BY KARSH OF OTTAWA

"Materials are important to the designer. . . thats why Talon, Inc. works with Sharon"

—THANE E. HAWKINS, chief engineer, Shu-Lok Fastener Division, Talon, Inc.

"To design properly the engineer has to know materials—their advantages and limitations," states Thane E. Hawkins, chief engineer, Shu-Lok Fastener Division of Talon, Inc.

"The Shu-Lok, we knew, would have to absorb extra heavy punishment—yet be as inconspicuous as possible. This meant a small, tough precision product. These factors dictated the use of steel—stainless steel. To get the quality stainless we needed, it was only natural to look to *Sharon Steel Corporation, Sharon, Pa.*"

SHARONSTEEL **SHARON** *Quality* **STEEL**

Outmoded Tactics: Time for Some New Ones

The way the steel union has fought the current battle is as old as the union itself.

The union made a list of demands as long as your arm. It knew it would not get any of them, but it acted as if its blast were legitimate.

The union then waited for the steel industry to make an offer. The industry made its first offer before negotiations: A one-year freeze on wage costs. The union did not consider this an offer and turned it down out of hand.

Even then the steel union did not understand that the industry was through rolling over. This, despite secret meetings in the spring of 1958 and 1959 between union and steel company advocates suggesting that the union's number was up—on big packages year after year.

Conrad Cooper, the steel industry's ace negotiator, tried to tell Dave McDonald he was for real on his demand for no employment cost increase. Dave thought that Mr. Cooper had something up his sleeve. He did.

The second offer from the steel firms was a willingness to talk about fringe benefits the first year and a moderate wage increase the second year. But only if the union agreed to grant contract language changes to produce more efficient operations and help finance the increase.

Up to that time the steel industry had Mr. McDonald on the run with its inflation issue. Then the "eight points" were injected into the hassle. These were hard to explain. Because there had been an overdose of legal gobbledegook on both sides, workers (and others) got lost in a word-fog. That was bad for steel.

Dave, being an old war horse at turning the trick, made it look as if the steel firms were taking the men back to industrial slavery. Management explanations later in the game clarified the featherbedding and wildcat strike issues. This offset to some extent the tactical gain of the union.

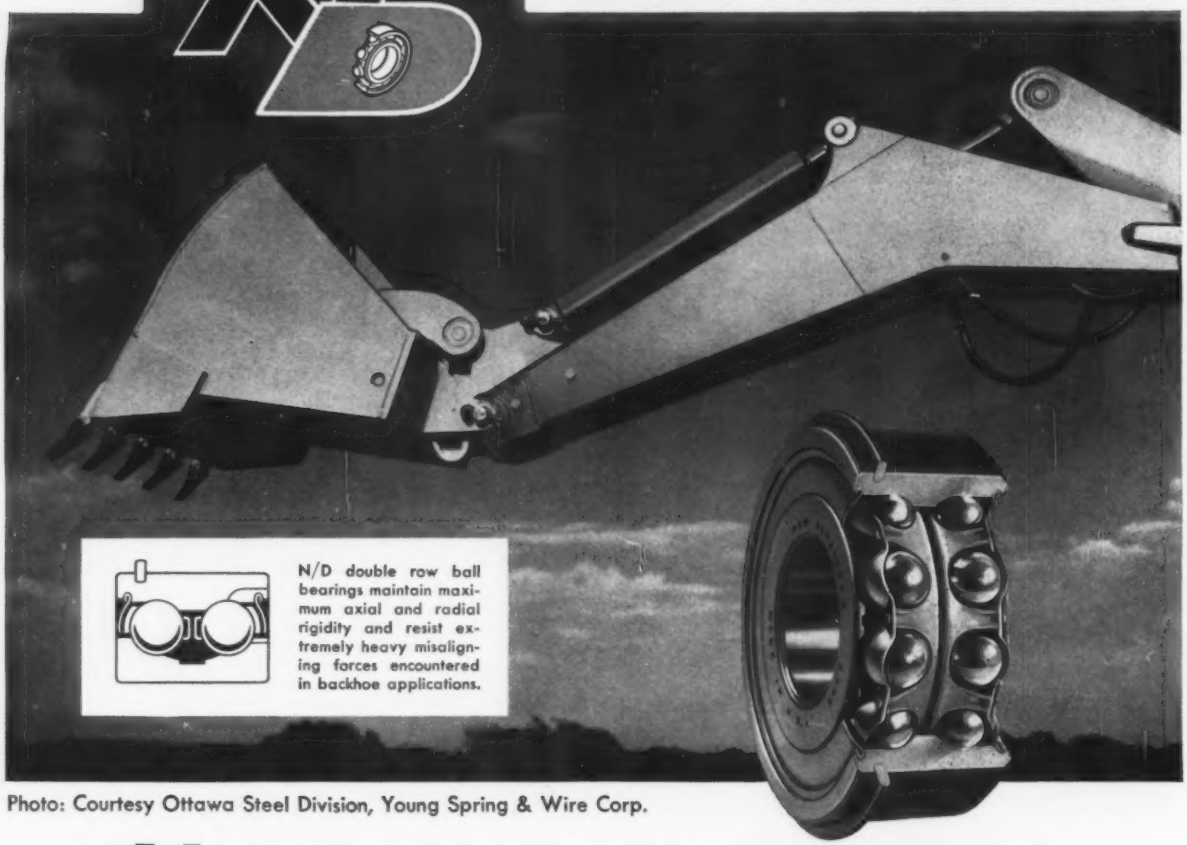
What started out as a bargaining item—language—in exchange for a small wage cost increase was pictured as a devilish company device by the union. There is not a thing wrong with what the companies want that confidence and cooperation would not fix up for both sides in a jiffy.

But confidence and cooperation are shot. They will stay that way until the union finds more reasonable tactics.

Tom Campbell

Editor-in-Chief

CASE HISTORIES



N/D double row ball bearings maintain maximum axial and radial rigidity and resist extremely heavy misaligning forces encountered in backhoe applications.

Photo: Courtesy Ottawa Steel Division, Young Spring & Wire Corp.

N/D Ball Bearings Reduce Friction... Up Usable Hydraulic Power In Backhoe!

CUSTOMER PROBLEM:

Increase efficiency of tractor/truck-mounted backhoe and reduce in-the-field maintenance requirements for the end customer.

SOLUTION:

N/D Sales Engineer, working with the manufacturer, recommended replacing 10 bronze bushings with factory lubricated New Departure shielded ball bearings. These New Departures eliminated arm play and loose joints . . . reduced friction to make more, useful hydraulic power available! What's more, shielded N/D ball bearings resist wear. They eliminated the need for relubrication maintenance because they're lubricated for life!

If you're working on new equipment designs, or redesigning, why not call on New Departure? New Departure's wide selection of construction and farm equipment ball bearings means there's probably a production bearing that will help you. For more information, write New Departure Division, General Motors Corporation, Bristol, Connecticut.

Replacement ball bearings are available through United Motors System and its Authorized Bearing Distributors.

NEW DEPARTURE

BALL BEARINGS

proved reliability you can build around

Embrittlement Data

Neutron diffraction techniques are solving the puzzles of why metals become brittle. One of the major suspects, hydrogen, is often difficult to detect. Now, a heavy water reactor at Argonne National Laboratory is giving data on the relative positions of light and heavy atoms in a metal-gas phase. This information will help reveal the nature of embrittlement.

Drill Tap Holes

Blast furnace workers at a Colorado plant have just come up with a new safe method of drilling blast furnace tap holes. A converted coal drilling rig is doing the job. By replacing manual drilling, the men in charge of the tapping can operate out of reach of the sparks and beads of hot metal that blow out of the hole.

Titanium-Clad Vessel

A titanium-clad pressure vessel of commercial size has withstood months of service by a petrochemical firm. This opens the door to the use of these vessels of high corrosion resistance by many processing industries.

Metal Mirror

Scientists are getting a better picture of the sun's surface due to a telescope mirror made of a cobalt-base alloy welded to a copper sheet. Suspended from a high altitude balloon, the telescope is not affected by the sun's heat. The previous mirror, continuously rotating to prevent overheating, gave image distortion.

Spin Under Pressure

An exclusive metal forming process, once used for the production of the first Titan ICBM nose cone prototype, is now being applied to the aircraft and electronics fields. The process involves the automatic application of hydraulic pressure to metal spinning. With pressures upward of 200,000 psi, incremental plastic deformation of metals such as 5/8-in. stainless and 3/4-in. aluminum can be achieved.

Casts Optical Silicon

A method for casting optical quality silicon for use in infrared sensors has been developed. This process permits volume production; previously, individual crystals had to be grown. The refractory material, selected for crucible and mold construction, can be used repeatedly. Moreover, the optical qualities of the cast, poly-crystalline silicon compare favorably with the grown single crystals.

Aluminum V-8 Engine

Look for an aluminum V-8 engine to be announced by one or more of the Big 3 in 1960 model run. Machine builders are already busy with experimental runs on components with silicon contents up to 8 pct. One head broach being readied for delivery reportedly licks a major barrier.

Machine Tool Report

First world-wide report on production of machine tools, by country, is nearing completion. Directory will list production, shipments, other statistical data by country of origin. Verifying this data is a tough problem. Tool-producing countries behind the Iron Curtain are inflating their statistics to match the claims of their leaders.

Magnetic Properties

Magnetic properties of core materials used for transformers, amplifiers, relays and servos are adversely affected by high temperature. Grain oriented materials are more affected by temperature cycling than unoriented materials. This information is part of a report issued by the U. S. Naval Ordnance Lab. The purpose of the study was to develop materials for use under extreme conditions.

Greater Corrosion Resistance

Longer Fatigue Life

Less Product Incrustation

new tests prove

CONTOUR-WELDED* STAINLESS TUBING

provides all three!

A recent series of tests prove TRENTWELD® tubing, made by the exclusive *Contour-Weld* process, is smoother than any other full-finished tubing. And still other tests show this extra smoothness ensures longer fatigue life, greater resistance to corrosion and less product incrustation.

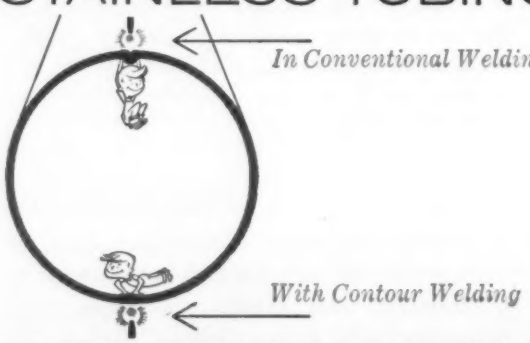
But here's why *Contour-welded* tubing is smoother inside:

First, it's smoother than seamless because it's formed from uniformly rolled strip steel, whereas seamless must be extruded or pierced.

And second, it's smoother than other welded tubing because the Trent-patented *Contour-Weld* process virtually eliminates the weld bead.

But why not get full details on *Contour welded* tubing's superiority? Send for the free 48-page "Trent Weld Manual." It's chock-full of details on *Contour-welded* tubing in sizes from ⅛" to 40" — in stainless and high alloy steels, titanium, zirconium, zircaloy and Hastelloy†. Write: Trent Tube Company, Box 2518, Pittsburgh, Pa.

†Trademark Haynes Stellite Co.



In **CONVENTIONAL WELDING** of tubes, gravity pulls molten metal down to form a bead that is difficult to remove by cold working. And cold working may lead to undercuts, focal points for fatigue cracks and corrosive attacks. Cleaning becomes difficult.

*With **CONTOUR WELDING** the tube is welded at the bottom. Gravity still pulls the molten metal down inside the tube, but now the weld area corresponds to the contour of the tube. There's virtually no weld bulge on the inside surface. And even on the O.D., the weld seam more closely conforms to the contour of the tubing.

CONTOUR TRENTWELD

stainless and high alloy pipe and tubing

TRENT TUBE COMPANY

Subsidiary of Crucible Steel Company of America • GENERAL OFFICES: East Troy, Wisc. • MILLS: East Troy, Wisc.; Fullerton, Calif.

Poll for Union?

Sir—Your Washington column in the Sept. 17 issue bears this statement, "Unions such as the United Steelworkers have long held honest elections and have permitted rank-and-file members to have their say on union policy matters." I suggest you familiarize yourself with the fact by asking rank-and-file members of the Steelworkers these questions:

Did you have an opportunity to express your wishes secretly as to whether the present steel strike should be called?

If you and other members had been given that opportunity do you think there would have been a strike?

What "say" have you in selecting delegates to national conventions?

What "say" have you regarding use of your dues for political activity?

What "say" did you have in the recent dues increase?

Did the delegates at the last convention who shouted down and threatened to expel certain of the Rarick faction truly reflect your "say?"

What happens to members who attempt to have their "say" in most local meetings if they do not conform to the "official" line?

Another article based on a thorough survey of this sort among membership of the USWA, UAW, IUE, IAM and others would prove interesting, I'm sure.—M. C. Hull, Ontario, Cal.

▪ There is much in what you say, but I wonder if it isn't a great deal like the political scene. We elect local, state, and national officials but we often wonder why they squander our money and sometimes seem unaware that they are elected officials.

Union members—when it comes to supporting their officers on a strike vote—often show a solidarity suggesting the union itself may live or die on the outcome.—Ed.

Responsibility

Sir—I have just read your editorial on personal responsibility in your Sept. 24 issue.

That is an article that many will do well to read. Standing for what you believe is right, sometimes in the face of almost intolerable opposition, is something that does not come easily. But we must have realism, and strength to face it.—R. O. Fristoe, plant engineer, Link-Belt Co., Indianapolis, Indiana.

Wafer Tools

Sir—In your September 10 issue you had some information on the building of cutting tools from preformed metal wafers which are assembled on standard arbors. Can you supply us with more detailed information on this subject?—E. C. Lomax, director of public relations, Vascoloy-Ramet, Waukegan, Ill.

"We got quite a response from that ad for a night-watchman . . . last night we were robbed!"

IN FASTENERS SOUTHERN IS

SERVICE

Southern Screw has built service into its policies and products for the past 13 years. Its service has helped industries to solve serious production problems by reducing down-time, cutting reject losses, improving product quality and by reducing inventory and handling problems.

Put Southern's famous one-source service to work for you in one or more of these problem areas. When you do, you'll find that service is more than a word at Southern. It is an integral part of the finest USA-made fasteners money can buy. Send your order of inquiry to Southern Screw Company, P. O. Box 1360, Statesville, North Carolina.

Tapping Screws • Machine Screws & Nuts • Wood Screws • Stove Bolts • Carriage Bolts • Dowel Screws • Hanger Bolts • Drive Screws

Manufacturing and Main Stock in Statesville, North Carolina

Warehouses: New York • Chicago • Dallas Los Angeles

1200 Pound Forged Steel "Muscle" For A Steam Hammer...

Forged Steel Piston for Steam Hammer
Hub — 25 inch diameter
Rod Length — 10 feet
Weight — 1200 pounds

Delivering the rated blow to steam hammer sow block and dies, this 1200 pound forged steel piston rod can "dish it out . . . and take it too" A mighty midget muscle controlling a big steel fist that hammers out drop forgings.

Relatively, this is a small but very tough forged component, compared to a 50 ton forged steel bending roll, or a 40 ton rotor for a power turbine.

The point is, however, that this 1200 pound forging is made with the same engineering and metallurgical supervision, the same experienced craftsmanship as the biggest, most critical forging produced in our shops. Quality control from raw material selection to finish machined component is standard operating procedure in our forge shops and foundries.

Let us consult with you before you select your source for steel forgings and castings.

ERIE FORGE & STEEL CORPORATION

ERIE, PENNSYLVANIA

Inside Story

In last week's magazine you probably read Tom Campbell's up-to-the-minute reports on the steel strike. In the IRON AGE which reached you Thursday were all the details of the industry's offer (announced late Monday), the union's rejection, and Tom's analysis of the situation.

Perhaps you'd like to know how this rapid, complete coverage of these fast-breaking events was managed.

From Phone to Tape—Tom dictated his story of the industry's offer and the union's rejection by telephone from negotiation press headquarters in Pittsburgh's Penn-Sheraton Hotel. His call was transmitted directly into the dictaphone at our Pittsburgh office.

There, Mary Fabian, Pittsburgh office secretary, teletyped it to the Philadelphia home office while she listened to the play-back.

. . . To Presses—At Philadelphia, the teletyped message was edited and sent to the printers. Several hours later, Tom's story analyzing the day's events was also teletyped to the home office and set in type.

Within hours after the stories were received they were rolling off the presses. And that's why, when you received your copy of IRON AGE Thursday, you were able to learn not only the latest news, but what it meant.

This week Tom continues his coverage of the strike with a special report on its impact, both now and in the months and years to come. You'll find it on p. 61.

Going, Going—Gone

One of our men sat in this week at an interesting event—a closed-circuit TV auction held at the same time in six cities.

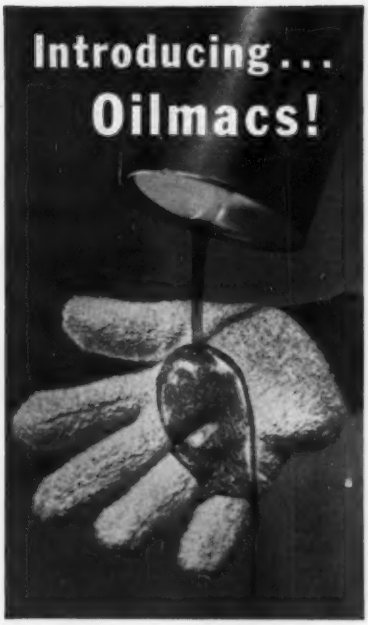
You'll find his report of this government surplus sale on p. 64 of this issue. We were intrigued, though, by Item 145—9059 pairs of unused snowshoes, wood frame, rawhide filling. We were even more impressed with their actual sale.

The snowshoes, all 9059 pairs, went for $9.50 a pair at a total sale price of more than $86,000. This sale alone more than covered the cost of the entire auction.

Puzzler Answer

There were a flock of winners for the bank-teller-check puzzler in the Sept. 17 issue. They include: W. L. Beaver, Artophone Corp., St. Louis; D. R. Siljestrom and W. L. Crow, Colorado Fuel and Iron, Denver; Myron Bowerman, The Alliance Machine Company, Alliance, Ohio; Byron Mitchell, Smith & Wesson, Springfield, Mass.; Bill Frank, Michael Flynn Manufacturing Co., Philadelphia; Garry Bub, Ambler, Pa.; and David Keller, United States Steel Corp., Pittsburgh, Pa. All said the answer is $28.57. Guess that's right.

"Now then . . . about the application you filled out for a job here at our plant . . ."



See? Oil actually runs right off specially treated Oilmacs. As you know, untreated gloves soak up oil like a blotter.

Oil-resistant terry cloth work gloves... by JOMAC®

Free sample pair will convince you . . . oil runs off these new Jomac gloves like water off a duck's back! Moreover, Oilmacs are far more cut-resistant than expensive leather gloves . . . are interchangeable . . . and can be reconditioned with virtually no loss in oil resistance. Mail coupon now . . . and you will soon start replacing those heavy, oil-soaked gloves with light, flexible Oilmacs!

MAIL THIS COUPON TODAY FOR
FREE SAMPLE PAIR!

JOMAC® Inc. Department K
Philadelphia 38, Pennsylvania

I'm interested! Please send free sample pair of Oilmacs, your new oil-resistant terry cloth work gloves.

Name_____
Company_____
Address_____
City_____
State_____

HELP

... on any customer's operating problem has top priority on the schedule of our technical service personnel. Your call triggers action—focuses attention on the answers you seek. For fast, effective, superior technical assistance, you can rely on GLC every time.

ELECTRODE
GLC
DIVISION

GREAT LAKES CARBON CORPORATION

18 EAST 48TH STREET, NEW YORK 17, N. Y. OFFICES IN PRINCIPAL CITIES

COMING EXHIBITS

Metal Show — Nov. 2-6, International Amphitheatre, Chicago. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

Air-Conditioning & Refrigeration Show — Nov. 2-5, Atlantic City, N. J. (Air-Conditioning and Refrigeration Institute, 1346 Connecticut Ave., N. W., Washington, D. C.)

MEETINGS

OCTOBER

Scientific Apparatus Makers Assn. —Mid-year meeting of Laboratory and Optical sections, Oct. 18-21, Lake Placid Club, Essex County, N. Y. Association headquarters, 20 N. Wacker Drive, Chicago.

The Electrochemical Society, Inc. —Fall meeting, Oct. 18-22, Deshler-Hilton Hotel, Columbus, O. Society headquarters, 1860 Broadway, New York 23, N. Y.

The Magnesium Assn. — Annual convention, Oct. 19-20, Hotel Roosevelt. New York. Association headquarters, 122 E. 42nd St., New York 17, N. Y.

American Society of Lubrication Engineers and **American Society of Mechanical Engineers**—Joint lubrication conference, Oct. 20-21, Sheraton - McAlpin Hotel, New York. Society headquarters, 84 E. Randolph St., Chicago.

American Standards Assn. — National conference on standards and annual meeting, Oct. 20-22, Sheraton-Cadillac Hotel, Detroit. Association headquarters, 70 E. 45th St., New York.

Association of Roller & Silent Chain Manufacturers — Fall meeting, Oct. 21-22, Hotel Roosevelt, New York. Association headquarters, 3343 Central Ave., Indianapolis.

Non - Ferrous Founders' Society— Annual meeting, Oct. 22-24, Bedford Springs Hotel, Bedford, Pa.

(Continued on P. 16)

"FASTER FROM FOSTER" service delivers any kind of pipe ...ANYWHERE

One call to any of Foster's six nationwide warehouses gets you immediate delivery of all the pipe you need, regardless of type, size or specification. L. B. Foster Company has made a specialty of supplying the "hard-to-get" sizes, the unusual walls, the extra large quantities.

Take advantage of "single-source" buying for all of your pipe requirements: Tested and Structural Steel Pipe in all sizes and specifications ⅛" thru 48", Stainless, Seamless Alloy and Pressure Pipe—Aluminum, Wrought Iron and PVC Pipe—complete lines of Valves, Fittings and Flanges.

For "complete package" shipments—for savings in time and money—try "Faster-From-Foster" service. Write, wire or phone your nearest Foster office.

L.B. FOSTER CO.

Pittsburgh 30, Pa. • New York 7, N.Y. • Chicago 4, Ill.
Houston 2, Texas • Los Angeles 5, Calif. • Atlanta 8, Ga.

Send for current Pipe Stock List No. IA-10

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WEBSTER

gal-va-nize (găl/və nīz/), *v.t.* 1. to simulate by or as by a galvanic current. 2. to coat (metal, esp. iron or steel) with zinc.

this is modern galvanizing

. . . with *Zincilate*®

Zincilating *is* galvanizing, brought up-to-date. Now, true galvanic protection can be provided for iron, steel or aluminum without the costs and nuisance of a complex, time-consuming process.

With Zincilate, you can . . . galvanize any component, product or structure—regardless of its size or shape . . . galvanize anywhere—in your plant or at the installation . . . galvanize any time—before, during or after fabrication . . . galvanize on production lines or on maintenance work. You can even repair hot-dip galvanize without pre-treatment.

If galvanize in any form or method enters your production or maintenance picture, you should know about Zincilate. Telephone, wire or write, outlining your present use of galvanize; we'll furnish the facts—you be the judge.

PROTECTION that SELLS your PRODUCTS

INDUSTRIAL METAL PROTECTIVES

402 Homestead Ave. • Dayton 3, Ohio • BAldwin 2-6747, 2-6743

EXHIBITS, MEETINGS

(Continued from P. 15)

Society headquarters, 1604 Chicago Ave., Evanston, Ill.

American Machine Tool Distributors' Assn.—Annual meeting, Oct. 25-27, The Statler Hotel, St. Louis. Association headquarters, 1900 Arch St., Philadelphia.

American Gear Manufacturers Assn.—Semi-annual meeting, Oct. 25-28, The Edgewater Beach Hotel, Chicago. Association headquarters, One Thomas Circle, Washington 5, D. C.

Scientific Apparatus Makers Assn.—Midyear meeting of Industrial Instrument Section, Oct. 25-29, Camelback Inn., Phoenix, Ariz. Association headquarters, 20 N. Wacker Drive, Chicago.

Rolling Mill Machinery & Equipment Assn.—Annual meeting, Oct. 26, Duquesne Club, Pittsburgh. Association headquarters, 1026 Farmers Bank Bldg., Pittsburgh.

Hoist Manufacturers Assn., Inc.—Meeting, Oct. 27, Warwick Hotel, Philadelphia. Association headquarters, One Thomas Circle, Washington 5, D. C.

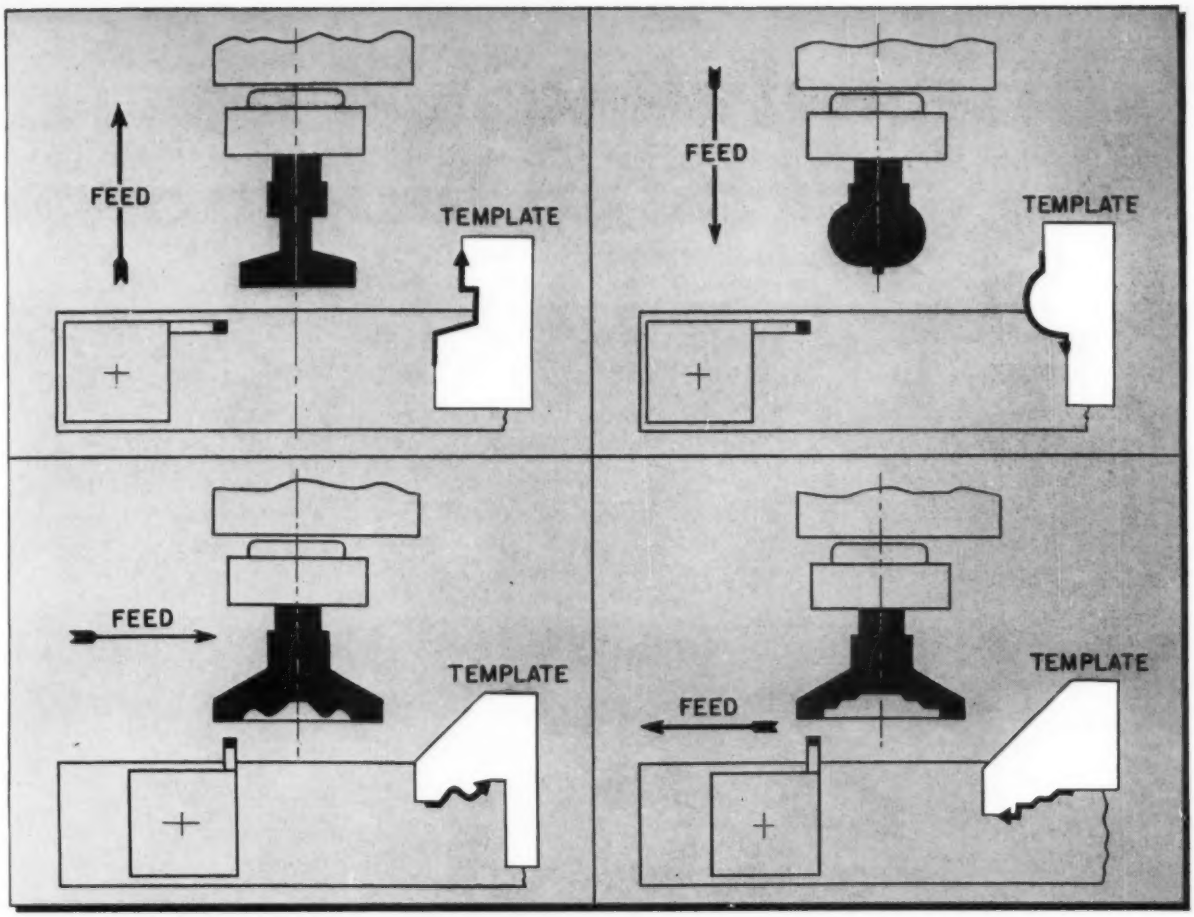
The Assn. of American Battery Manufacturers Inc.—Fall convention, Oct. 29-31, The Palmer House, Chicago. Association headquarters, 19 N. Harrison St., E. Orange, N. J.

National Metal Trades Assn.—Convention, Oct. 29-31, Sheraton-Biltmore Hotel, Providence, R. I. Association headquarters, 337 W. Madison St., Chicago.

NOVEMBER

Society for Non-Destructive Testing, Inc.—Annual convention, Nov. 2-6, Hotel Hamilton, Chicago. Society headquarters, 1109 Hinman St., Evanston, Ill.

Institute of Metals Div., AIME—Fall meeting, Nov. 2-6, Morrison Hotel, Chicago. Institute headquarters, 29 E. 39th St., New York.



ALL FOUR of these Automatic Tracing Cycles are available with a SINGLE Jones & Lamson Turret Lathe

the man who needs a new machine tool is already paying for it

How's this for machine flexibility in one chucking? (1) You get all of the accuracy and tooling combinations offered by the standard J & L Turret Lathe. (2) You have more than 180° of tool travel control in each of four different automatic tracing cycles (you don't *have* to have *all* four, incidentally). (3) You do both rough and finish tracing (*with rough and finish tools*) in the same set-up. (4) You multiple-tool your tracing operations through 180° of tool control. (5) You have complete control for diameter with the conventional graduated hand wheel on either mechanical or *tracing* operations. (6) The original full swing of the Turret Lathe is retained with this tracer. (7) A single lever disconnects the tracer for standard turret lathe operation.

Such flexibility enables you to perform an amazing amount and variety of work with this new *Two-Dimensional Tracer* on J & L Saddle Type Turret Lathes.

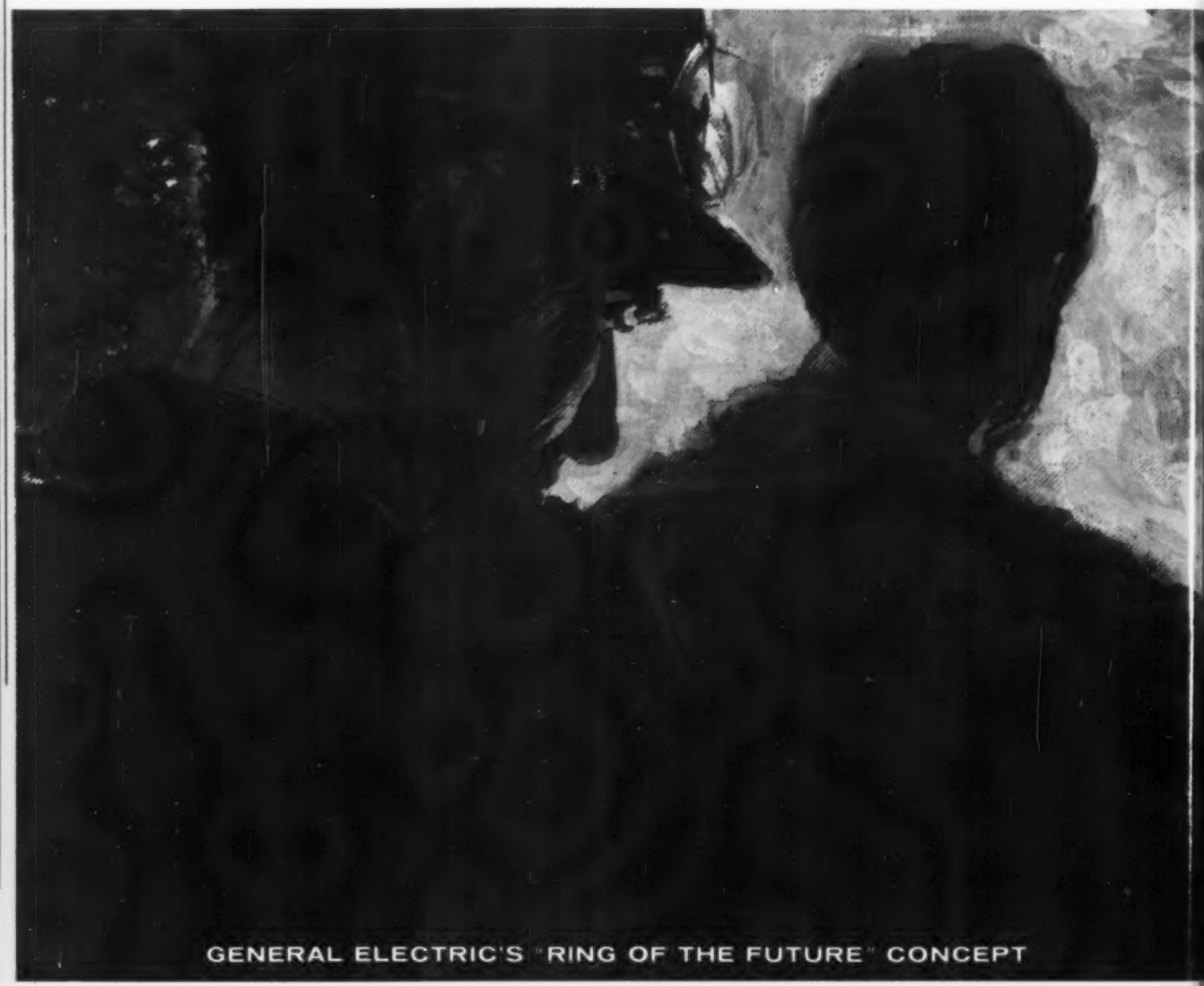
It all adds up to: MAXIMUM WORK COMPLETED IN ONE CHUCKING; REDUCED HANDLING TIME; INCREASED ACCURACY. Write for further information.

JONES & LAMSON Machine Company • Dept. 710, 511 Clinton St., Springfield, Vt.

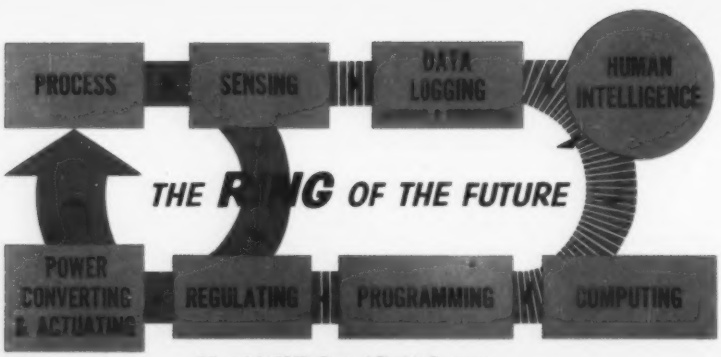
Turret Lathes • Automatic Lathes • Tape Controlled Machines • Thread & Form Grinders • Optical Comparators • Thread Tools

General Electric can help you . . .

MODERNIZE FOR PROFITS ...through automation



GENERAL ELECTRIC'S "RING OF THE FUTURE" CONCEPT



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"THE RING OF THE FUTURE"...

. . . General Electric's approach to automation, helps you blend the products of today into the systems of tomorrow . . . provides a logical, step-by-step approach to modernization through automation. Start your program now. Call your General Electric Apparatus Sales Office for complete information about the "Ring of the Future" and how it can be applied to:

- **REVERSING HOT MILL PROCESSES**
- **HOT STRIP MILL PROCESSES**
- **CONTINUOUS MILL PROCESSES**
- **PROCESS LINE OPERATIONS**

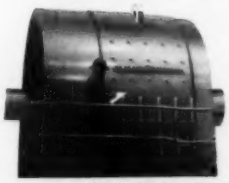
You can meet your competitive challenge decisively with a planned program of modernization . . . modernization that provides greater machine flexibility, higher efficiency and output from your metal rolling and processing systems. General Electric stands ready to assist you in blending the products of today into the systems of tomorrow. To learn more about modernization through automation, mail the coupon below for General Electric's "Ring of the Future"* kit.

For a 13" x 29" lithograph copy of this painting suitable for framing, write on your letterhead to address below.

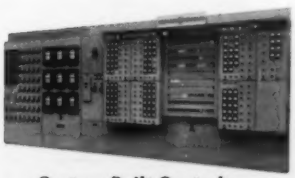
CAN HELP YOU MODERNIZE FOR PROFITS

Computers

MD-600 Armored Motors



Main Drive D-c Motors



Custom-Built Controls

TO: SECTION 823-1,
GENERAL ELECTRIC COMPANY,
SCHENECTADY 5, NEW YORK

.....Please send me G.E.'s "Ring of the Future" kit.

Name.....

Position..... Company.....

Address.....

City..... State.....

Progress Is Our Most Important Product

GENERAL ELECTRIC

TAKE THIS SHIRT-SLEEVE SHORT-CUT TO MORE EFFICIENT ASSEMBLY!

Are you open-minded about methods of permanent fastening? If so, it will pay you to call in your nearby Thomson Fastening Man. Ask him to look at your new-product sketches or old-product assembly lines. Chances are, he can tell on the spot whether you can speed production or cut costs with time-tested automatic positioning and fastening techniques. If not, he'll pass your problem, drawings or samples along to his home-office engineers who know when riveting beats stapling, welding, cementing and other permanent fastening methods.

Your Thomson Fastening Man sells by giving shirt-sleeve service. He's more interested in solving fastening problems than in selling rivets. So, use him freely as your direct contact with 75 years of fastening experience. Why not make a date with him soon? Write today to Dept. IA.

JTL

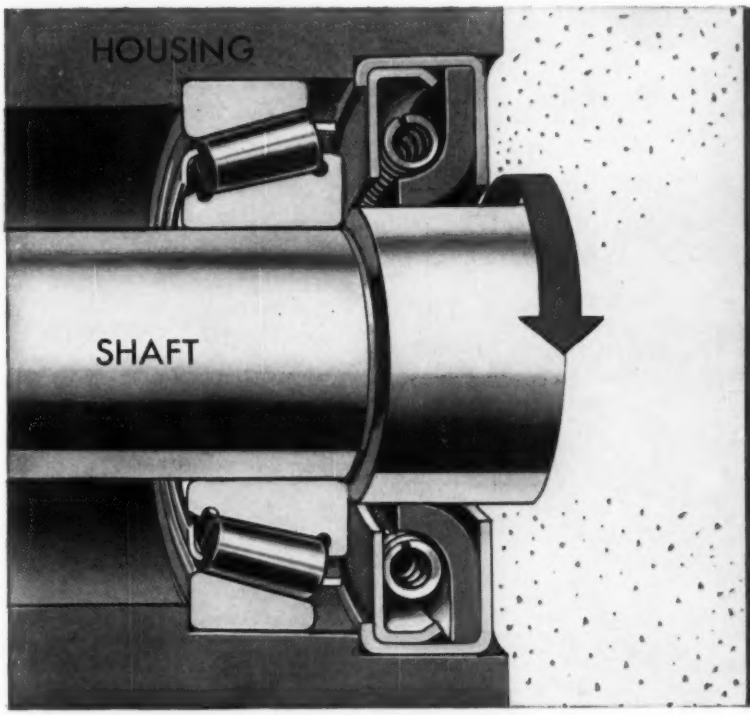
JUDSON L.

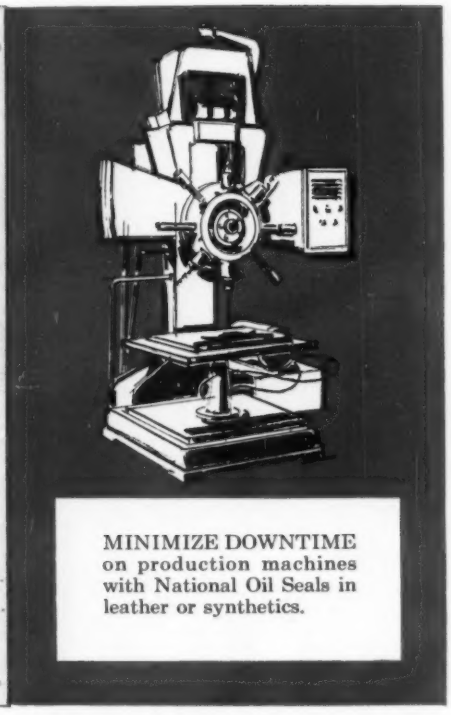
THOMSON

MFG. CO., WALTHAM 54, MASS.

Rivets and Rivet-Setting Machines

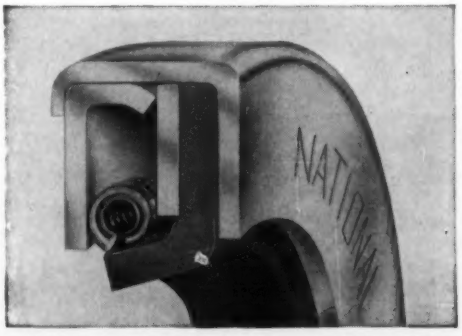
Better products, *faster*, from your Bearing Specialist:





MINIMIZE DOWNTIME on production machines with National Oil Seals in leather or synthetics.

In leather or synthetic, National industrial oil seals keep lubricant in, dirt out of your valuable machines!



National Oil Seals feature: 1. *Micro-Torc* leather that seals in oil and grease, has untreated side to absorb lubricant; 2. *Syntech* synthetics "prescription-blended" to meet specific operating conditions.

National Micro-Torc and Syntech oil seals—in any standard size or made to order—protect big investments at low cost

Count on National Oil Seals to guard your costly machines! They seal *in* the lubricant so vital to precision bearings; seal *out* abrasive dirt and corrosive moisture so harmful to bearings and other machine components—and there's one for *any* job.

National Micro-Torc leather is impregnated only part-way through. The coated side seals perfectly; the untreated, porous side absorbs the lubricant leather needs to stay flexible, run cooler and longer. **National Syntech synthetics** are "prescription-blended" to meet the most exacting conditions of temperatures, shaft speeds and other critical factors. Both types come in all sizes.

In leather *or* synthetic, National industrial oil seals protect your capital investment at low cost. So why take a chance on a used seal? Call your National Seal specialist for replacements!

NATIONAL OIL SEALS

FEDERAL-MOGUL SERVICE

DIVISION OF FEDERAL-MOGUL-BOWER BEARINGS, INC. • DETROIT 13, MICHIGAN

Now...hard-hitting support for

Look for this new 4-color advertisement in...
LIFE October 19 32,000,000 readers
BETTER HOMES & GARDENS November 16,000,000 readers
THE AMERICAN HOME November 12,000,000 readers
60,000,000 prospects for aluminum building products
Which of these 24 money-saving ideas should you consider before remodeling?
Aluminum Limited
FREE!
Unusual tear-out, postage-free coupon offers new aluminum products booklet

...will attract thousands of inquiries for aluminum building products

your aluminum product sales!

60,000,000 prospects— over 2/3 of the nation's homeowners are the target of this new national advertising by Aluminium Limited . . .

. . . created to seek out immediate prospects for aluminum products made by you and your customers!

Watch your sales opportunities skyrocket in October and November—

when this exciting 4-color spread breaks in LIFE . . . BETTER HOMES & GARDENS . . . and THE AMERICAN HOME!

The advertisement is aimed at 60 million prospects for aluminum building products. And in this group are more than 2/3 of the nation's homeowners.

This new national advertising is created to increase retail sales, thereby increasing sales throughout the entire aluminum industry. The advertising does this by showing the many exciting ways the homeowner can use aluminum. And to provide the tie-in at the retail level, there's an unusual tear-out coupon offer for the new 36-page booklet, "How to remodel on a budget . . . with aluminum."

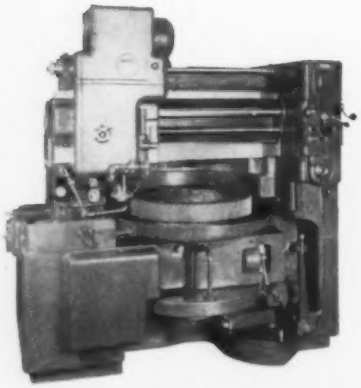
Experience tells us we can expect as many as 150,000 inquiries for the booklet. A list of inquiries, broken down by product and geographical area, will be passed on to the nation's retailers by our U.S. fabricator customers.

Aluminium Limited

ALCAN

Ingot Specialist...serving American Aluminum Fabricators—

In the U.S.—Aluminium Limited Sales, Inc., 630 Fifth Avenue, N.Y. 20, N.Y.
CLEVELAND • CHICAGO • LOS ANGELES • DETROIT • ATLANTA • ST. LOUIS



Fellows Gear Shapers cut internal and external spurs and helicals; capacities up to 120" P.D.

Pfauter Gear Hobbing Machines cut spur and helical gears; capacities up to 120" P.D.

No. 12 Fellows-Reishauer Gear Grinding Machines grind spurs and helicals up to 12" O.D.

COMPLETE COVERAGE

FOR EVERY REQUIREMENT IN MODERN GEAR SHAPING, HOBBING, GRINDING AND INSPECTION EQUIPMENT!

Only Fellows delivers everything you need for modern gear production! No other builder offers as long a line: Fellows Gear Shapers, Pfauter Gear Hobbers, Fellows-Reishauer Gear Grinding Machines, as well as all the Fellows production machine attachments, inspection instruments, and special machines! And that's not all: if your plant has gear production problems we haven't already met in over sixty years of specialization, we'll take solid New England pride in meeting and solving them. Ask your Fellows Representative to show you how new machines from Fellows can help you keep up in the productivity race. Ask him for more information on Fellows service and the full range of gear production and inspection instruments. Or simply write The Fellows Gear Shaper Company, 78 River Street, Springfield, Vermont. Branch Offices: 1048 North Woodward Avenue, Royal Oak, Michigan; 150 West Pleasant Avenue, Maywood, New Jersey; 5835 West North Avenue, Chicago 39, Illinois; 6214 West Manchester Avenue, Los Angeles 45, California.

FELLOWS GEAR PRODUCTION EQUIPMENT

Pride in his work!

Here's a man who really has it. His educated touch, on the controls of this 4-high rolling mill, holds Bristol Brass sheet and strip to precisely the specified thickness, *down to tenths of thousandths of an inch.* This working combination of mill-wise men and modern machinery is what makes every foot of Bristol sheet and strip "Brass at its Best."

The **BRISTOL BRASS CORPORATION**

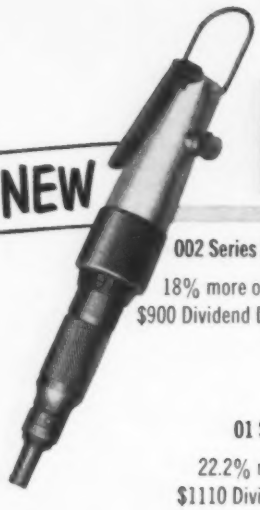
Since 1850, makers of Brass strip, rod and wire in Bristol, Connecticut
Bristol Brass has offices and warehouses in Boston, Buffalo, Chicago, Cleveland, Dayton, Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, Rochester, Syracuse

AND FOR BRASS FORGINGS, TOO . . . ACCURATE BRASS CORP. (SUBSIDIARY OF THE BRISTOL BRASS CORP.), BRISTOL, CONNECTICUT.

3 NEW SERIES IR SCREW DRIVERS

give you an ANNUAL DIVIDEND on your PAYROLL DOLLARS

NEW **DESIGNS**
SPEEDS
POWER



002 Series Screw Driver
18% more output . . . for
$900 Dividend Dollars/year.

01 Series Screw Driver
22.2% more output . . . for
$1110 Dividend Dollars/year.

NEW

NEW

0002 Series Screw Driver
75% more output . . . for
$3750 Dividend Dollars/year.

If your operators are using older model screw drivers, you can increase their man-hour productivity by as much as $3750 Payroll Dollars in one year, just by replacing the older tools with one of the three new I-R designs.

Multiply these *Annual Dividends* by the number of screw driver operators in your plant, and you can see why management today is taking a new look at portable tool operations.

There's a fast, easy way to calculate the amount of *Dividend on Payroll Dollars* these new I-R screw drivers can help you earn in just one year—without adding to your present payroll.

It's yours without obligation. To get it, call your I-R AIRengineer today. Or write Ingersoll-Rand, 11 Broadway, New York 4, N. Y.

Ingersoll-Rand

Tools plus AIRengineering increase output per man

8-925

Name your load and speed combinations...

Schatz makes the most varied line of Ball Bearings to fit your needs

"Functional Precision" Ball Bearings—BR series

One piece race type with ball cage. Designed to give all the precision you require under certain ratios of load, speed and life expectancy. Available in open type, single or double shielded, single or double sealed with Schatz patented low friction plastic seal. Or with one shield and one seal on special order.

23 sizes from $^{3}/_{16}$" to 1"—6 types in each size + specials

"Commercial" Ball Bearings

The most complete and varied line anywhere.

UNGROUND BALL BEARINGS "TYPE A"—Every standard type—radial, thrust and radial thrust.

GROUND BALL BEARINGS "TYPE B"—Used and recommended where greater accuracy and smoother running qualities are needed and where loads are heavier and speeds higher.

1033 sizes to match your Bearing Application Needs

FILL IN AND MAIL

We'll fit these bearings—or special types and sizes to your special needs. Just fill in your application problem below—attach to your letterhead and mail.

THE SCHATZ MANUFACTURING COMPANY, Poughkeepsie, N. Y.
Here's our bearing problem. What do you suggest?

APPLICATION_____

LOAD (radial, thrust or both)_____

SIZE_____

SPEED_____

LIFE FACTOR_____

OPERATING CONDITIONS_____

SPECIAL CONDITIONS_____

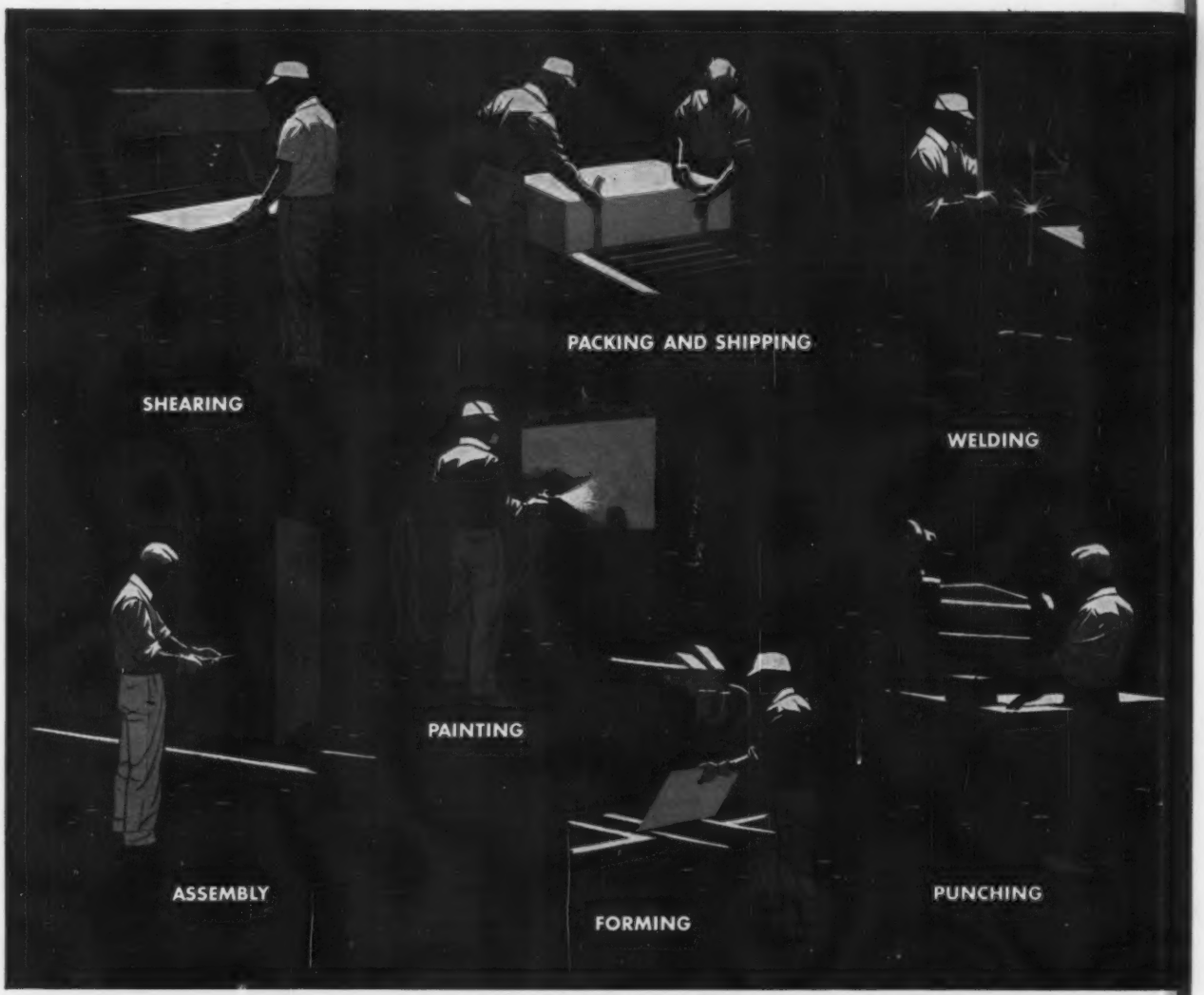
Name_____ Title_____

Company_____

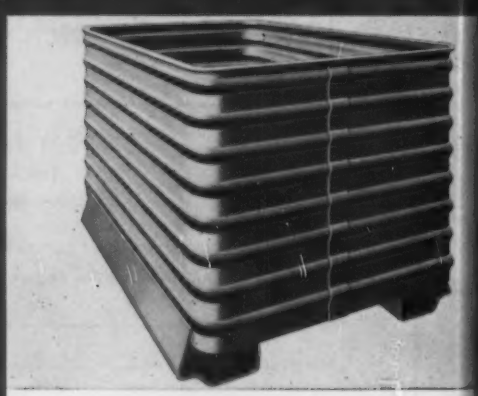
Address_____

City_____ Zone_____ State_____

SCHATZ
BALL BEARINGS



REPUBLIC MATERIALS HANDLING EQUIPMENT helps you save time in stack, store, ship operations. They speed materials handling and reduce storage space area requirements. Stacking does not damage the boxes. Heavy-duty stacking brackets and corrugated construction combine to deliver long, efficient service at low per-year cost. Four-way fork channels simplify handling in restricted space. Let Republic's Berger Division materials handling specialists work with you in solving your problems. Write today.



B-90 BOX with offset channels for roll-over and tiering. Can be used with a truck having a revolving fork carriage. The offset channel under box permits tiering without an obstruction at top of the box, since the offset in the channel rests on top flange. Call your Republic-Berger representative, or send coupon.

REPUBLIC...can do it for you

complete sheet steel fabrication facilities

Contract manufacturing is a full time operation at Republic. Berger Division Engineers work with you in developing your product. Broad sheet steel fabrication facilities and experienced craftsmen solve your manufacturing, assembly, delivery problems.

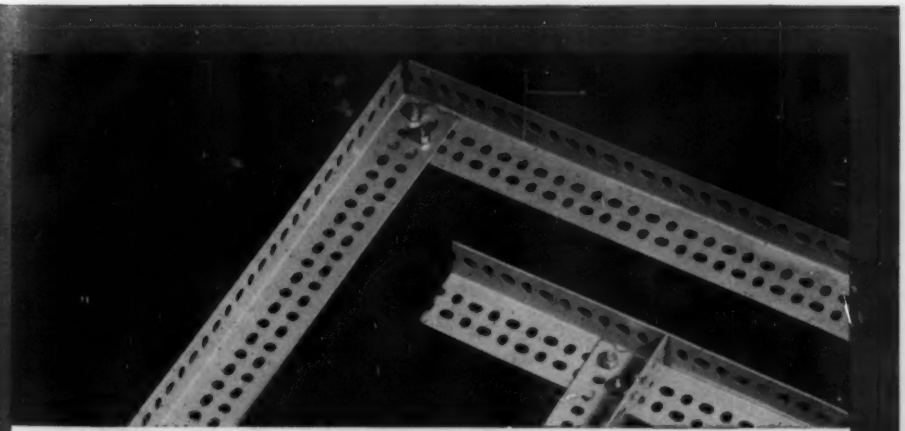
Republic's Berger Division has complete facilities. Well rounded stock of tools and dies, and a complete machine shop. Modern assembly lines for shearing, punching, forming, finishing, and painting.

Standard and special arc, spot, and gas welders designed for production line assembly. Tumbling barrels and plating equipment. Grinders and sanders for final trim and finish.

Finest finishing facilities including Bonderizing and electro-static paint spray equipment. Finishing conveyors through spray booths, dip tanks, and baking ovens. Automatic materials handling equipment. Completely mechanized crating department with conveyor line carton-packaging facilities.

Berger Division complete sheet steel fabrication know-how and facilities may be the answer to your assembly-production problems. To learn more about Republic-Berger contract facilities, call or write today.

CALL YOUR REPUBLIC REPRESENTATIVE OR WRITE...



REPUBLIC METAL LUMBER® is the answer to erecting fast, economical, framing assemblies. It is as easy to use as common lumber. Yet, stronger... because it is made of heavy gage steel. METAL LUMBER is engineered with a scientifically designed pattern of slots arranged on ¾" centers. Even complicated framing problems are easy because this unique system of short longitudinal and transverse slots make possible an unlimited number of straight and angular combinations. Simply measure, cut, assemble—using standard bolt and nut fasteners. Delivered in packages of ten pieces, in 10- and 12-foot lengths. Bolts included. Write today.

REPUBLIC STEEL CORPORATION
DEPT. IA-8495
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO
Please send additional information on the following:
☐ Republic Contract Facilities
☐ Republic Materials Handling Equipment
☐ Collapsible Boxes
☐ Republic METAL LUMBER
☐ Please have an engineer call

Name_____ Title_____
Firm_____
Address_____
City_____ Zone____ State_____

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

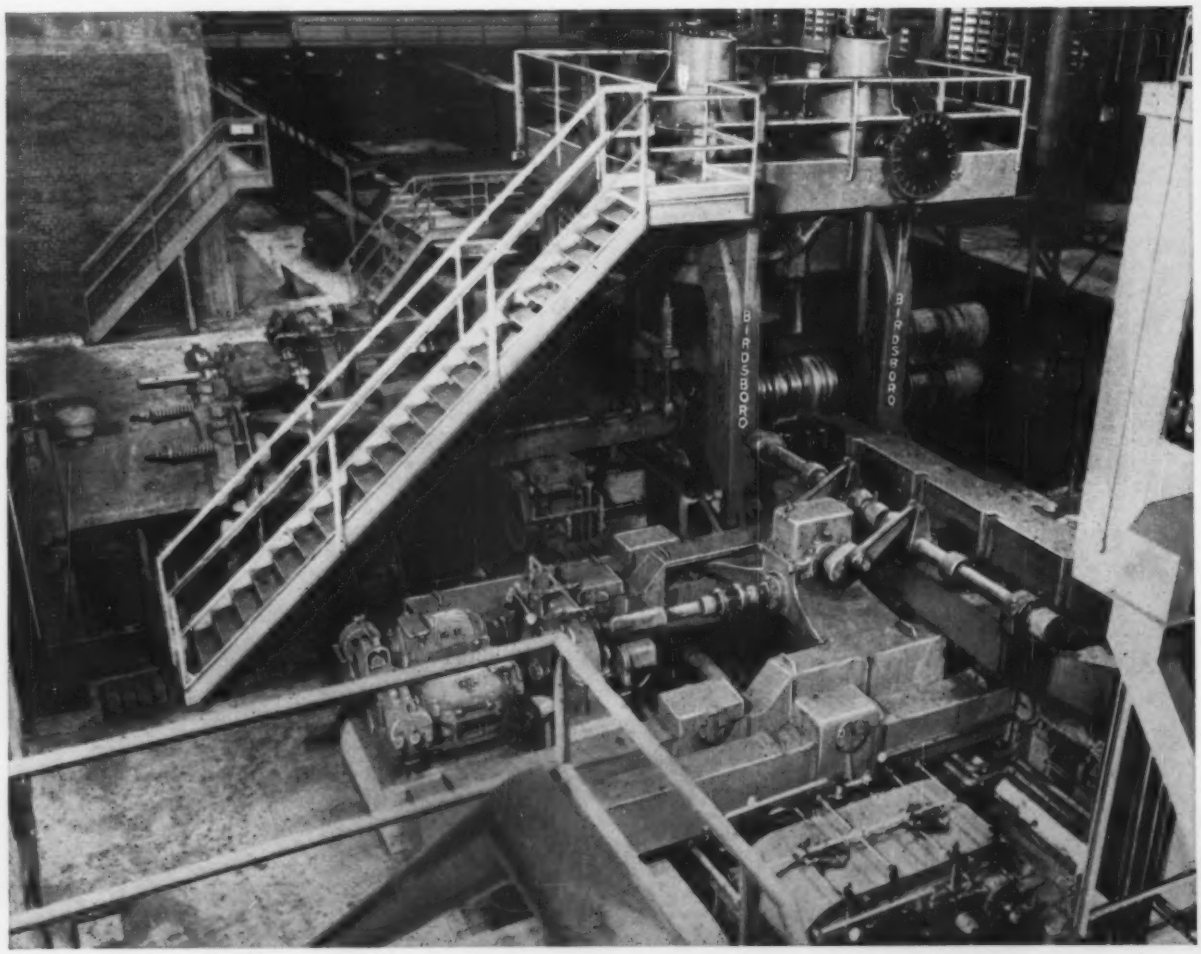
In Utah, **U. S. Steel's** *production horse (32" blooming mill) carries the famous* **BIRDSBORO** *brand*

In the New West, work horses are still being branded. Nowadays, the brand is no longer used to prevent rustling, but as a hallmark of pride.

In U.S. Steel's Geneva Works out in Utah, the BIRDSBORO brand rides high on the 32" blooming mill. Key installations throughout the world carry this name. It has come to represent more than machines, but ideas, too . . . ideas that have frequently helped pioneers of both East and West to advance the steel industry and its products ever forward.

Whether it be a single unit of equipment or a complete mill installation, BIRDSBORO's customized engineering can be a valuable tool in your expansion and modernization.

Ask for details of some of our recent projects that might have application in your plant, or call in the BIRDSBORO engineers for their appraisal of your own pioneering venture. *Sales Department, Engineering Department and Mfg. Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa.



MM77-59

BIRDSBORO

STEEL FOUNDRY AND MACHINE CO.

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel

Steel plant reports on use of B&W Kaocrete-32 in critical sections of electric furnace roofs:

•36% saving in installation time

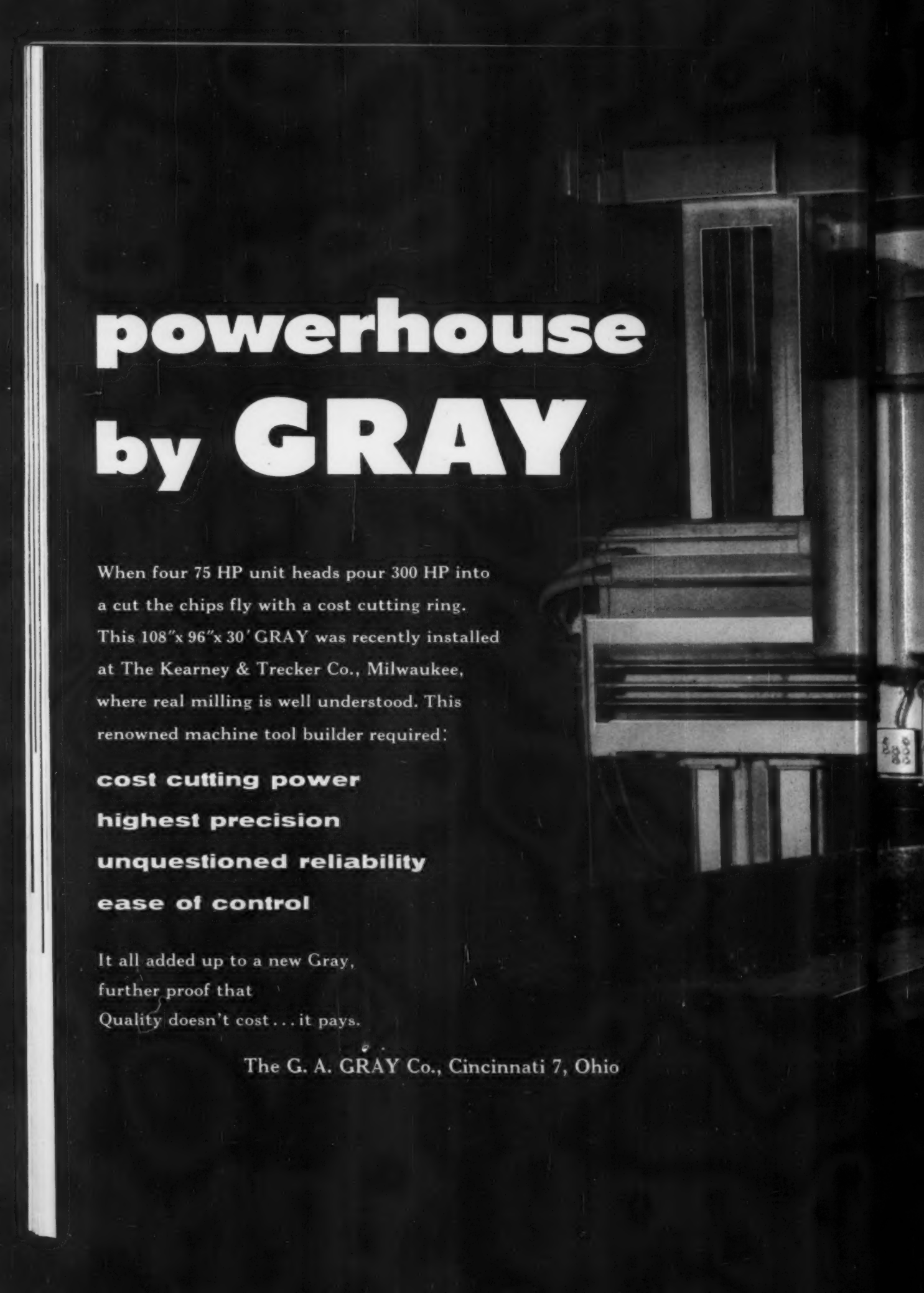
•42% increase in roof life

•20% reduction in refractory costs

For further information on how you can profit with B&W Kaocrete-32 in electric furnace roofs, consult your B&W refractories representative or send for technical bulletin RR-46.

B&W REFRACTORIES PRODUCTS: B&W Allmul Firebrick
• B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick
• B&W Refractory Castables, Plastics and Mortars • B&W Silicon Carbide
• B&W Ramming Mixes • B&W Kaowool

BABCOCK & WILCOX
THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 161 EAST 42nd ST., NEW YORK 17, N.Y.
WORKS: AUGUSTA, GA.



powerhouse by GRAY

When four 75 HP unit heads pour 300 HP into a cut the chips fly with a cost cutting ring. This 108"x 96"x 30' GRAY was recently installed at The Kearney & Trecker Co., Milwaukee, where real milling is well understood. This renowned machine tool builder required:

cost cutting power
highest precision
unquestioned reliability
ease of control

It all added up to a new Gray,
further proof that
Quality doesn't cost . . . it pays.

The G. A. GRAY Co., Cincinnati 7, Ohio

GRAY

Announcement of Major Significance

FOR EVERY USER OF SOCKET HEAD CAP SCREWS

Following exhaustive studies begun in 1954, the socket screw products industry adopted, on April 24, 1959, new dimensional standards for socket head cap screws. Standard Screw Company participated in these studies and concurred in the recommendations approved by leading fastener manufacturers.

Adoption of the new standards, to be known as the "1960 Series", has important implications for every user of socket screws. As a public service Stanscrew will point out these implications . . . not only in relation to its own products, but also to the overall program of the industry.

Differences, Advantages Of New Design

The "1960 Series" has been carefully engineered so there is functional uniformity for all sizes, particularly as it applies to wrenching areas and to the relationship of head diameters to body diameters. For most sizes, as illustrated, this means substantial increases in both head diameter and socket size, and thus provides these advantages over the present design:

1. *Maximum utilization of the fastener's inherent strength . . . larger wrenching area permits application of greater clamping force.*
2. *Increased bearing surface under the head . . . up to 233% more.*
3. *Minimum indentation . . . particularly important with softer metals.*

Should You Convert Now?

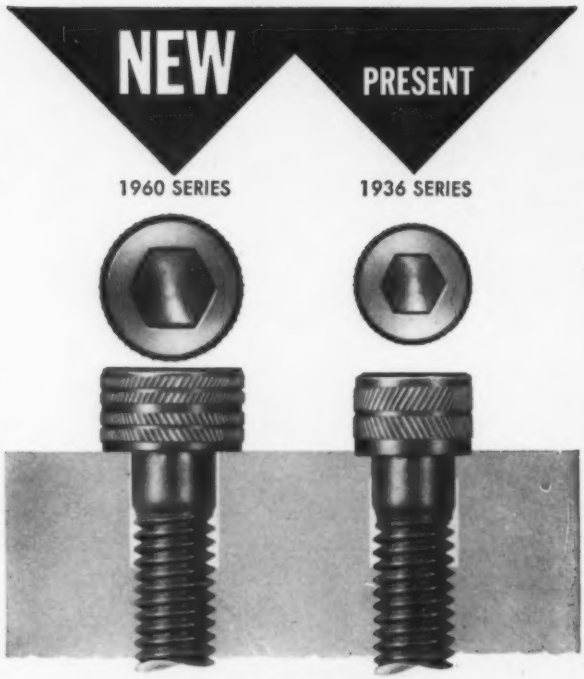
Obviously, for many applications, the new design offers important benefits which indicate conversion as rapidly as possible. In some cases, however, existing product design may not accommodate the larger heads . . . or, where socket cap screws are countersunk, revising your countersinking operations may create significant production problems. Stanscrew urges, therefore, that each company learn complete facts on the fastener industry's future plans.

Timetable For Industry Changeover

Stanscrew has already started production of the new "1960 Series". Manufacture of the present (1936) series will continue, however, and they will be available as standard, in-stock items until at least January 1, 1961. At that time, it is now contemplated the "1960 Series" will become the accepted standard throughout industry and the "1936 Series" will then be furnished only when specifically ordered.

When Designing A New Model

For products now on the drawing board, this timetable indicates many manufacturers should plan to use the "1960 Series" as the standard for later production. By making such design provisions, you assure maximum acceptance and minimum difficulty in the future.



For Existing Products

For many existing applications, where socket cap screws are not countersunk, either the 1936 or the "1960 Series" may be used. In frequent cases, improvements of the 1960 design suggest conversion within a short period. In other applications, where the heads are countersunk or where the greater head diameters of the "1960 Series" create a problem, changeover should probably be postponed until a general redesign of your product is scheduled.

Special Stanscrew Marking

To further distinguish its "1960 Series", Stanscrew will knurl heads of all new style socket cap screws with a split herringbone design (as shown). This special marking and the new "1960 Series" box labeling will provide quick identification of these quality fasteners.

For Further Information

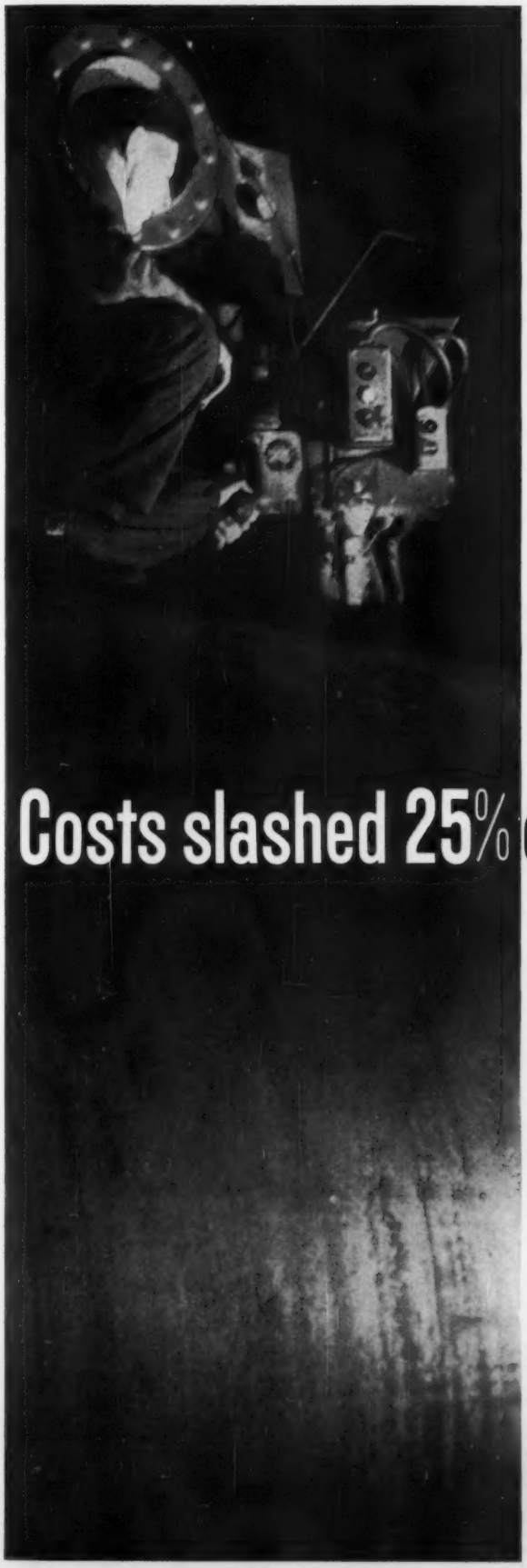
Your Stanscrew distributor has the latest facts on the new "1960 Series" and will be happy to discuss them with you. If desired, he also will arrange for a prompt visit from a Stanscrew fastener specialist who will be most happy to go over all aspects of this new industry program as it regards your own particular operation.

Stanscrew also has a new brochure which provides complete dimensional and design data on the "1960 Series". No obligation, of course, for your copy.

STANSCREW FASTENERS

CHICAGO | THE CHICAGO SCREW COMPANY, BELLWOOD, ILLINOIS
HMS | HARTFORD MACHINE SCREW COMPANY, HARTFORD, CONNECTICUT
WESTERN | THE WESTERN AUTOMATIC MACHINE SCREW COMPANY, ELYRIA, OHIO

STANDARD SCREW COMPANY 2701 Washington Boulevard, Bellwood, Illinois



Business is booming
at R & R Tank Company!
And now profits are rolling in.

Six months ago, welding costs
were twenty-five to thirty percent higher.
And the profit squeeze was tight.
But no longer!

New production methods
and faster, superior equipment
and electrodes turned the tide.

"How did we accomplish this?
The easiest way possible", says
Mr. Floyd Reinhardt, R & R's president.
"We called in the man who
knows most about welding procedures—
the Lincoln Welding Engineer.

"He suggested some easy changes
which were routine to him, I guess,
but they were news to us."

Costs slashed 25% on tank production

RESULTS: A change in fabricating sequence
plus a switch to "Jetweld 1", iron-powder electrodes
saved 25% through faster welding and easier cleaning.
The three new "Lincolnweld" automatics
increased production and cut the
automatic welding costs by 30%.

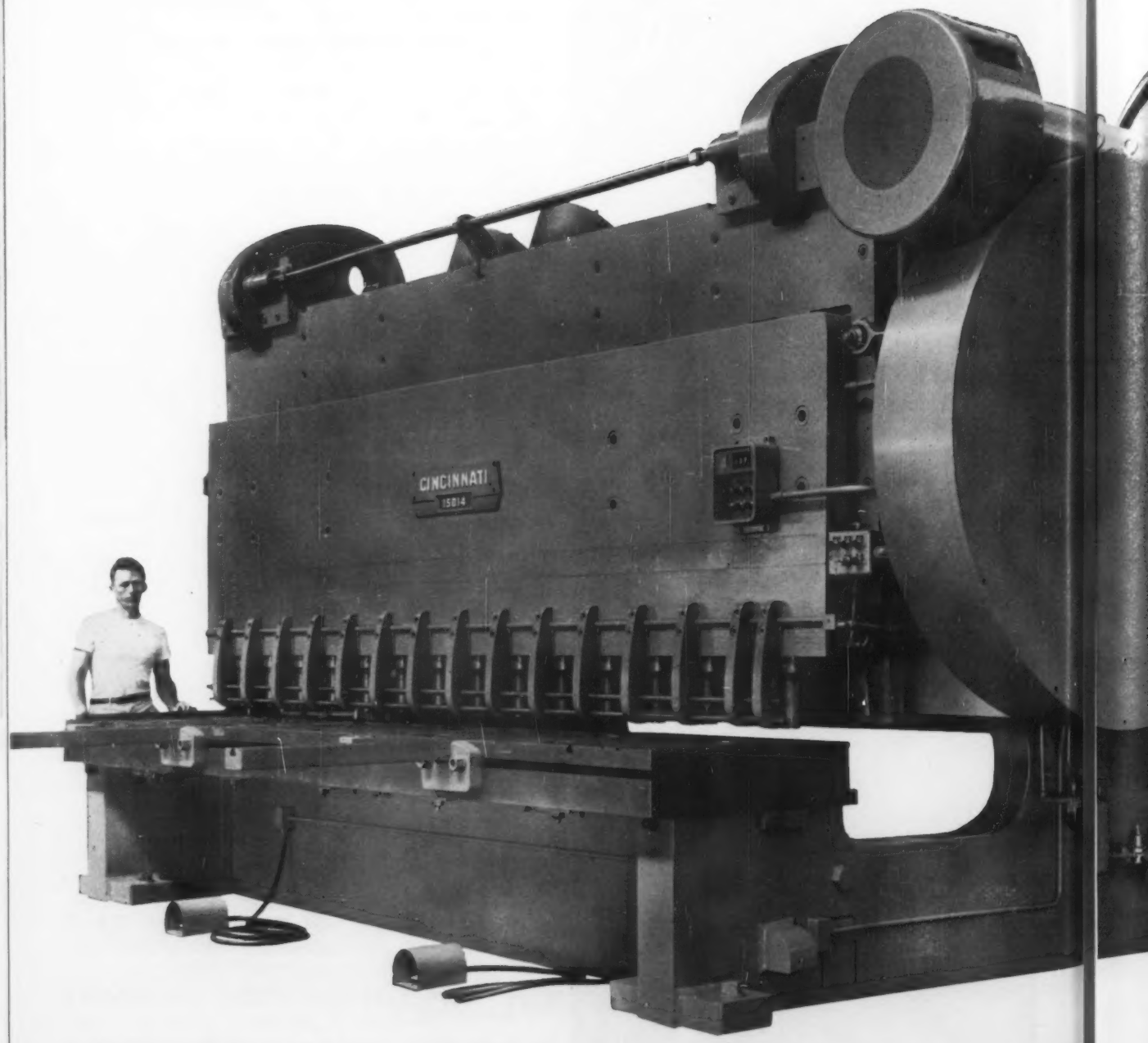
Do you want to save time and money
on your welding operations?
Call your Lincoln Welding Engineer today!

LINCOLN

THE LINCOLN ELECTRIC COMPANY
Dept. 1560 • Cleveland 17, Ohio
The World's Largest Manufacturer of Arc Welding Equipment

This CINCINNATI®...

1¼ in. thick X



shears mild steel plate

14 ft. long

This 15014 Series Cincinnati All-Steel Shear has a 36″ gap and a 48″ back gage range.

Power for heavy cutting with accuracy and operating convenience are combined in this machine.

Modern features such as — Hydraulic Holddowns, Front Operated Power Back Gage, Hinged Back Gage Angle, Automatic Pressure Lubrication, All-Steel Interlocked Construction, Forged Alloy Steel Eccentric Shaft—all contribute to an outstanding performance with low maintenance and high accuracy.

See your Cincinnati Representative for either Heavy or Light Shearing Applications. Write for Catalog S-7R.

Shapers / Shears / Press Brakes

THE CINCINNATI SHAPER CO.

Cincinnati 11, Ohio, U.S.A.

WHEELABRATOR® cleans structurals faster and cleaner, at lower cost

Two important things are wrong with wire brushing structural steel to remove rust and scale. First, it's too slow and costly to be tolerated in an efficient operation. Second, it doesn't get the steel clean.

Where blast cleaning is required prior to fabricating, galvanizing, or painting structurals, Wheelabrator airless blast cleaning will cut your costs and give you important additional advantages.

Wheelabrator Cabinet installed at a prominent Canadian firm for descaling a wide range of structural steel members and steel plate. Advantages of Wheelabrator descaling are: increased and lower cost production, a cleaning versatility that has led to faster deliveries, and more effective and longer-lasting paint adherence.

The wasteful process of wire brushing is entirely eliminated. Any degree of cleaning can be achieved, down to virgin metal, if desired, giving you complete control over the cleaning process. Paint or other coating adheres tenaciously to the scale-free surface, cutting maintenance and repainting costs.

Leading structural fabricators have found that they can blast clean all their steel at far less cost than they can wire-brush only on specification. And they get additional savings through greater efficiency when working with thoroughly cleaned steel — steadier production, more lineal feet of welding, faster painting, better inspection, fewer rejects.

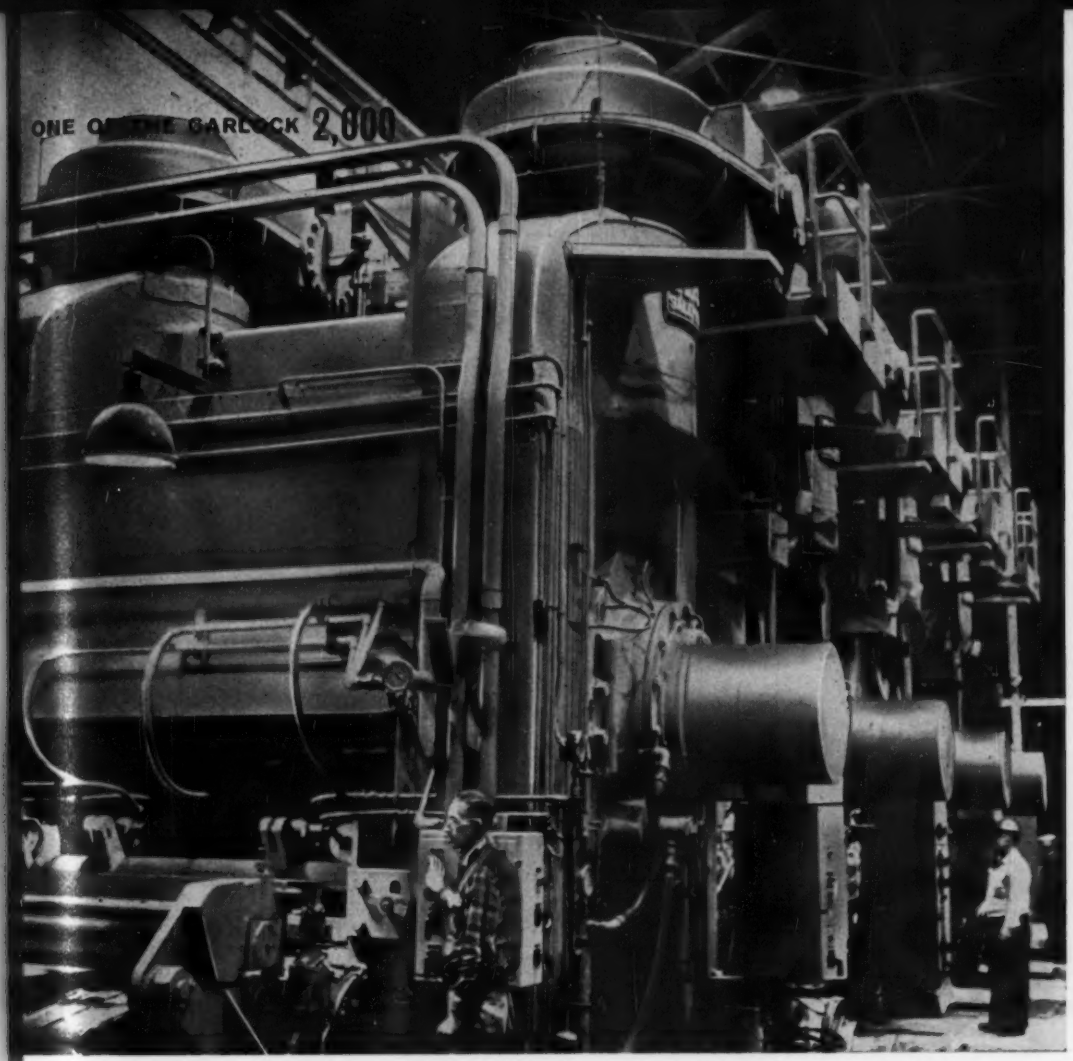
The facts in the case for blast cleaning structurals are presented in our new illustrated booklet. Write today for free copy.

WHEELABRATOR
CORPORATION

510 South Byrkit Street **Mishawaka, Indiana**

Canadian Offices: Scarborough (Toronto) – Montreal

World's largest manufacturer of airless blast cleaning equipment and abrasives



Model 64 assembled KLOZURE for back-up and work rolls. Designed for large shafts, severe service.

Model 82 bonded KLOZURE for back-up and work rolls, normal to high speeds. Comes as large as 44" diameter.

Model 21 or 23 Split-KLOZURE for installation without disassembly of equipment. Medium-speed service.

Model 142 face type KLOZURE for mill rolls. Designed to seal surfaces perpendicular to shaft.

Model 53 assembled KLOZURE for table rolls, normal to high speeds. Withstands temperatures to 250° F.

On all mills—Bearings are fully protected by Garlock KLOZURE* Oil Seals

Everywhere in steel—on hot and cold strip mills, blooming and structural mills, rolling mills—Garlock KLOZURE Oil Seals prevent leakage of vital bearing lubrication. And, they further prevent damage to the bearings by sealing out dirt, spray, and other foreign matter.

Model 142, for example, keeps water splash and scale out of bearings at the shoulder of a mill roll. Models 64 and 82 are ideal for protecting bearings on back-up and work rolls; Model 53 is recommended for table rolls; and, where equipment can't be dismantled easily, Model 21 or 23 split-KLOZURES are the choice.

All KLOZURES are oil and grease resistant . . . impervious to water, mild acids, alkalies . . . non-abrasive . . . withstand temperatures from −40° F. to +250° F. For extreme conditions, Garlock furnishes sealing elements resistant to practically any fluid, and serviceable as high as +500° F.

KLOZURE Oil Seals are another part of the Garlock 2,000 . . . two thousand different styles of packings, gaskets, and seals for every need. Call your local Garlock representative, or write for Catalog 20.

THE GARLOCK PACKING COMPANY, Palmyra, N. Y.

For Prompt Service, contact one of our 26 sales offices and warehouses throughout the U.S. and Canada.

**Registered Trade Mark*

GARLOCK

Packings, Gaskets, Oil Seals, Mechanical Seals, Molded and Extruded Rubber, Plastic Products

Canadian Division: The Garlock Packing Co. of Canada Ltd.

Plastics Division: United States Gasket Company

Trailer axles take shape as automatic butt welder upset flash welds spindles to each end of 40-inch lengths of Pittsburgh Steel Co.'s mechanical tubing at Kenton, Ohio, plant of Rockwell-Standard's Transmission and Axle Division.

An Axle Axiom: Long Service Life

Pittsburgh Steel Company's Seamless Tubes Give Years of Service in Rockwell-Standard Corp.'s Trailer Axles

Mechanical tubing from Pittsburgh Steel Company covers a lot of ground —in truck trailer axles.

Pittsburgh Steel is a prime supplier of mechanical tubing to the Kenton, Ohio, trailer axle plant where the Transmission and Axle Division of Rockwell-Standard Corp. makes trailer axles for every major trailer manufacturer.

• **Uses C1040 Grade Tubing**— Rockwell-Standard uses AISI C 1040 grade hot rolled tubing, ranging from 4-inch outside diameter with a ⅜-inch wall thickness to tubing 6 inches in diameter with ½-inch wall.

Typical tubing shipped to Rockwell-Standard is made of fine grained steel in a uniform hardness range which enables the customer to develop the final physical properties he wants by heat treatment.

Pittsburgh Steel tubing performs satisfactorily in Rockwell-Standard's processing operations and satisfies the ultimate user—the trailer manufacturer —because we meet these requirements from tube to tube and from shipment to shipment.

Hardness is a prime requirement because lack of uniformity would require more costly operations at Rockwell. With Pittsburgh Steel tubes, heat treating can be standardized with predictable results.

Weldability scores high. Long service life of trailer axles demonstrates the weldability of Pittsburgh Steel's tubing. With an average of

10 welds in every axle, welds have to be good. Strength and porosity tests prove they *are* good.

Freedom from scale helps promote predictable results from heat treating. Scale would produce steel with different rates of hardness after heat treating. No de-scaling operation is necessary with Pittsburgh Steel tubes.

Uniformity of wall thickness helps to prevent warping of axles in oil quenching and eliminates re-straightening in many cases or holds such operations to a minimum.

• **Tubing first is cut to length** by Rockwell to make axles which will track either 70 inches or 71½ inches, both standard widths. Forged spindles then are flash upset welded, one on each end of the tube. Welds are made simultaneously.

Next, tube and spindle assemblies pass through a high heat furnace on a moving conveyor. For the two hours each assembly is in the 60-foot long furnace it is subjected to a temperature of 1500 degrees F. Each 1½ minutes, an assembly emerges from the furnace to be oil quenched.

To temper the assemblies to the desired Brinell hardness, each passes through a draw furnace where it soaks for an hour in 1000 degrees F.

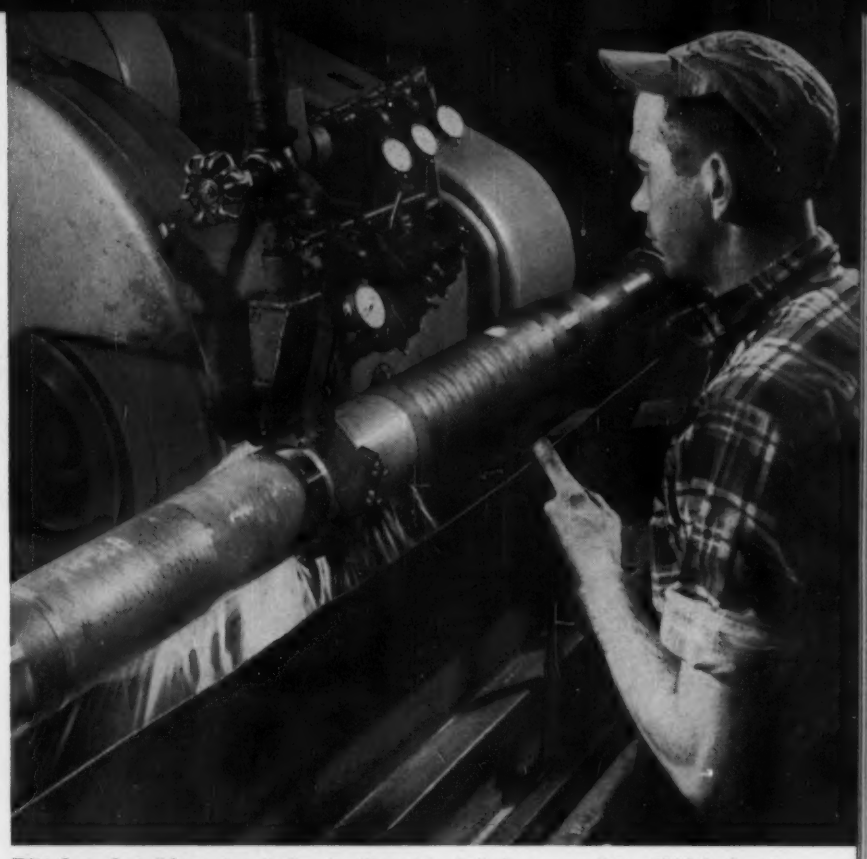
Rockwell-Standard wants a rating of 269 to 321 for spindles and 218 to 269 for tubing.

Axles then are cleaned by shot in a Wheelabrator and moved to the Machine Shop. Spindles are machined to final contours, welding flash is removed and threads are machine rolled.

• **After accessories,** like spider brackets, diaphragm brackets and cams are welded to the axle, stress relief follows to ease strains set up by welding. An hour's treatment at 900 degrees F. does the trick.

On the final assembly line, each axle gets a brake system fitted to the brake spiders. Nylon support brackets and grease fittings are added, the axle is greased, painted and moved to the shipping platform.

Close-up of brake spider being submerged arc welded. Four welds are made simultaneously.



Pittsburgh tubing, five inches in diameter, is being ground to .4880 inches to meet specifications.

You don't have to be a manufacturer of axles to enjoy the same benefits that Rockwell-Standard gets from Pittsburgh Steel tubing.

Any tube user who wants to lower production costs while making a better product can profit by using Pittsburgh Steel tubular specialties.

You get the physicals you want and you can expect better performance in fabrication. Talk to a Pittsburgh Steel man today. You'll find him in one of the district offices listed below.

Pittsburgh Seamless Distributors

Baker Steel & Tube Company
Los Angeles, California

Chicago Tube & Iron Company
Chicago, Illinois

Cleveland Tool & Supply Co.
Cleveland, Ohio

Drummond McCall & Co., Ltd.
Montreal, Quebec, Canada

Edgcomb Steel Company
Philadelphia, Pennsylvania

Gilmore Steel & Supply Co.
San Francisco, California

Earle M. Jorgensen Co.

Perry Kilsby, Inc.
Los Angeles, California

Mapes & Sprowl Steel Co.
Union, New Jersey

Metal Goods Corporation
St. Louis, Missouri

Miller Steel Company, Inc.
Hillside, New Jersey

A. B. Murray Co., Inc.
Elizabeth, New Jersey

C. A. Russell, Inc.
Houston, Texas

Ryerson, Joseph T. & Son, Inc.
Chicago, Illinois

Solar Steel Corporation
Cleveland, Ohio

Steel Sales Corporation
Chicago, Illinois

Tubular Sales
Detroit, Michigan

Ward Steel Service Company
Dayton, Ohio

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

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PICKLED in a 4% brine solution!

CHOKED
in a tornado of abrasive dust!

FROZEN
for weeks at 75° C below zero!

BURIED ALIVE
in thick, sluggish mud!

nothing . . . but nothing stops Super-Seal open-type motors

Thanks to exclusive Poxeal and Silco-Flex insulations, Super-Seal motors have shown endurances that even enclosed motors couldn't match. Results and reasons available from your A-C representative or distributor. Or write General Products Division, Milwaukee 1, Wisconsin

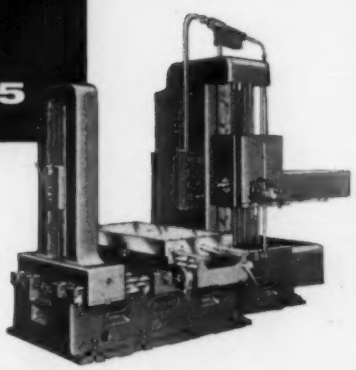
ALLIS-CHALMERS A-1151

Poxeal, Silco-Flex and Super-Seal are Allis-Chalmers trademarks.

GET *MORE FOR YOUR MONEY

. . . with a BULLARD

Horizontal Boring Machine • Model 75



The Gas Turbine Department of the General Electric Company, Schenectady, N.Y., recently installed a Bullard Horizontal Boring Machine, Model 75. We are confident that they got more for their money.

This "*MORE" includes: —

GREATER RIGIDITY — heavier cuts at higher speeds.

PRECISE ACCURACY — hold boring tolerances to .0005.

TABLE OUTBOARD SUPPORTS — provides work alignment even with unbalanced table load.

PENDANT CONTROL — full machine control from position most advantageous to operator.

CHROME HARDENED WAYS — on Bed and Saddle for longer wear.

BED LEVELS — built into Bed for easy checking.

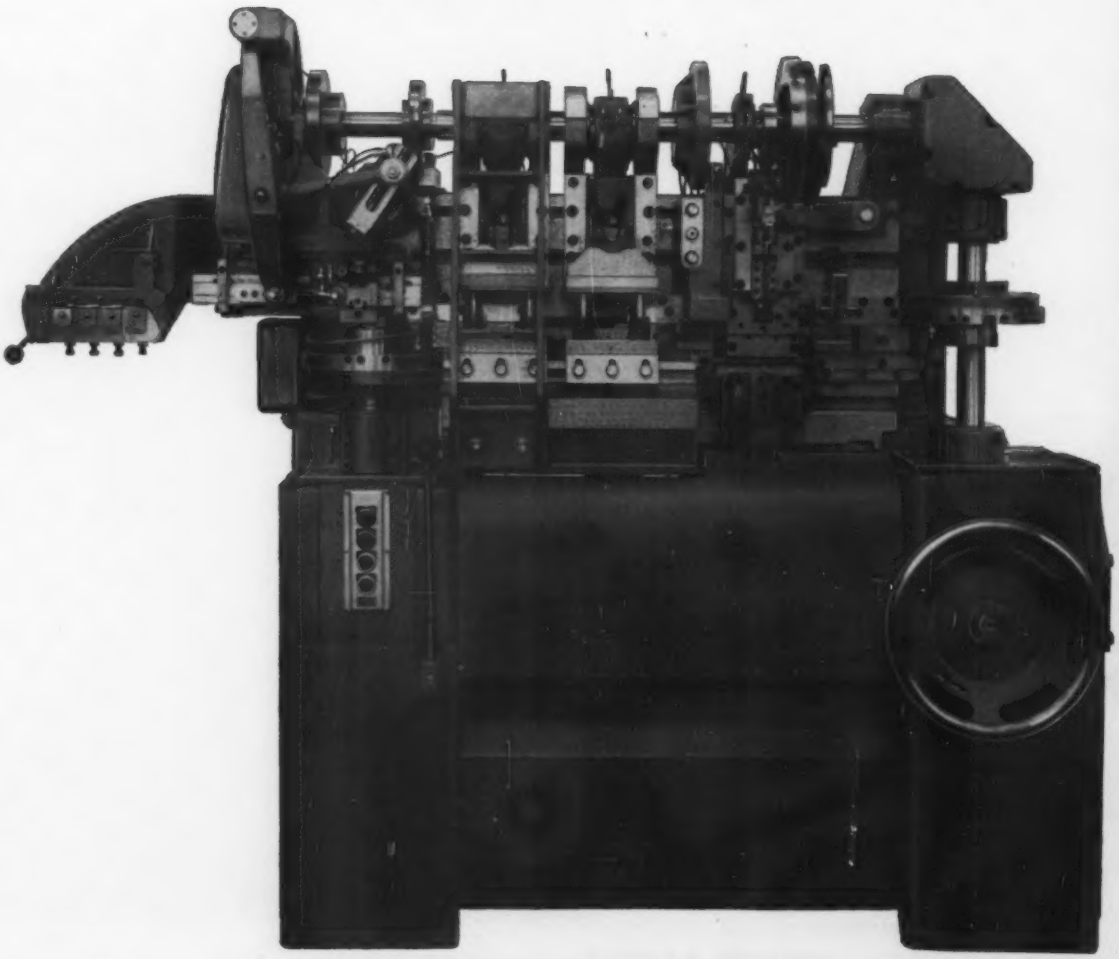
FAST SERVICE — after two years of operation, little trouble, and minor complaints handled promptly.

Investigate and compare and you, too — will discover you get more for your money with a Bullard H. B. M., Model 75.

ASK YOUR BULLARD SALES ENGINEER OR WRITE FOR FULL SPECIFICATIONS TO.....

THE BULLARD COMPANY
BRIDGEPORT 9, CONNECTICUT

ON ITS FIRST PRODUCTION JOB THIS REVOLUTIONARY MACHINE...



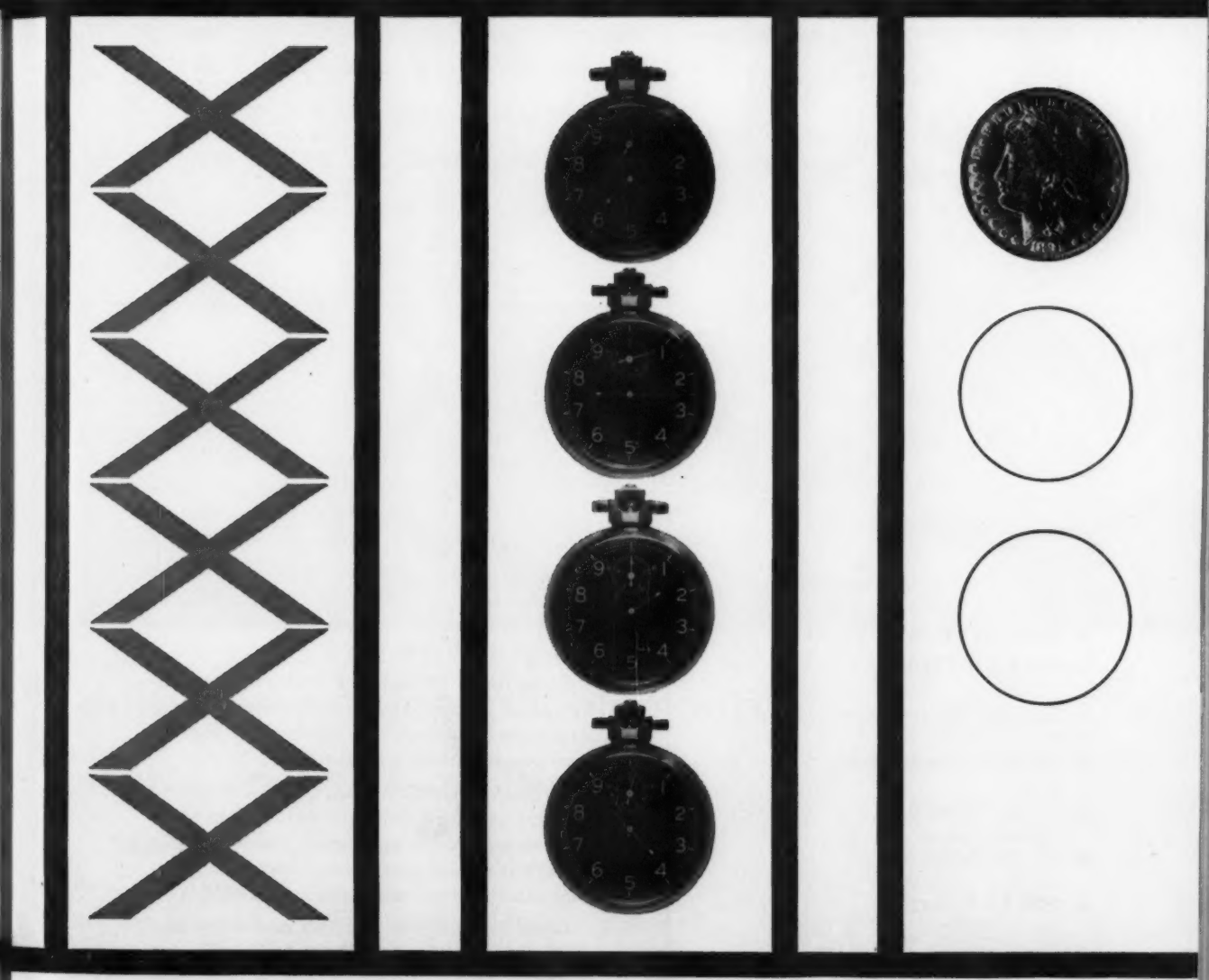
It's the sensational Torrington **Verti-Slide,** a most important **new** production tool. This amazing new vertical four-slide machine promises a genuine revolution in the **high-speed, high-precision, low-cost production** of just about everything in strip or wire that is now being produced on progressively tooled forming presses or conventional four-slide machines. Write or call today for complete technical data—or a Torrington sales engineer.

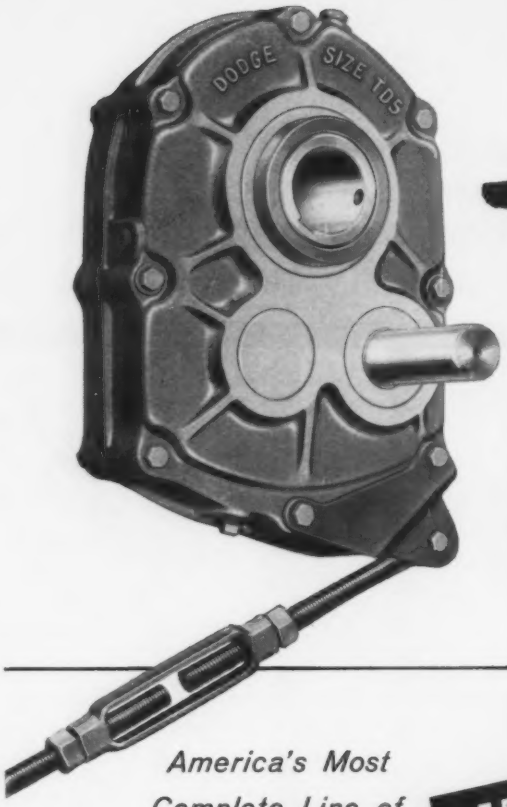
THE TORRINGTON MANUFACTURING COMPANY
TORRINGTON, CONNECTICUT • VAN NUYS, CALIFORNIA • OAKVILLE, ONTARIO

DID THE WORK OF SIX PROGRESSIVELY TOOLED FORMING PRESSES...

AT FOUR TIMES THE SPEED...

AND ONE-THIRD THE COST!





Torque-Arm

THE DODGE DEVELOPMENT THAT CHANGED THE NATION'S HABITS OF SPEED REDUCTION

America's Most Complete Line of Shaft Mounted Speed Reducers

55 MODELS

- Capacities up to 170 hp
- Output speeds from 10 to 378 rpm!
- Single Reduction
- Double Reduction
- 5 to 1 Ratio
- 15 to 1 Ratio
- 25 to 1 Ratio
- Any speed ratio up to 150 to 1 obtainable by selection of pre-determined combination of reducer and V-belt drive.

CALL THE TRANSMISSIONEER—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the *white* pages of your telephone directory for "Dodge Transmissioneer."

In fewer than ten years, the range of Torque-Arm Shaft Mounted Speed Reducers has increased from 6 to 55 models, to meet the ever increasing demand for this improved method of speed reduction.

By eliminating foundation, sliding base and flexible coupling this modern speed reducer has saved untold installation time and untold dollars of cost.

The rugged semisteel housing developed by Dodge has never been improved upon. It is corrosion resistant—and it has the strength to hold bearing seats in line for the life of the unit.

Dodge design provides wide spacing for the bearings. Loads are carried easily, contributing to Torque-Arm's long life and very high efficiency. The gears are finest quality—helical, heat treated steel.

Torque-Arm mounts vertically or horizontally in any position around the driven shaft. It locks to the shaft on *both* sides of the housing. The holes in the output hub provide simple removal with puller. Overload release and built-in backstop are optional.

Dodge Torque-Arm is America's most widely used shaft mounted speed reducer. It is stocked by your local Dodge Distributor. Ask him. Or write us for bulletin.

DODGE MANUFACTURING CORPORATION, 800 Union, Mishawaka, Ind.

DODGE
of Mishawaka, Ind.

"Looking for a dependable source for steel rolls? Call National,"

says Bill Mason, Assistant to Manager—Roll Sales.

"When you call, let me tell you about our complete customer service and our expanded facilities for producing steel rolls . . . plain or grooved, in all grades. Many of our facilities are new, from the steel foundry building itself to the melting and heat treating furnaces, and precision machining equipment.

"Also, you can be sure that from the time your order reaches us it will get the individual attention given every roll order at National from careful checking of specifications and skillful manufacture to follow-through in the field by experienced representatives.

"We believe this special attention is reflected in the outstanding performance of National rolls in our customers' stands. You will be pleased with their performance in *your* stands.

"Call National for your steel roll requirements."

GENERAL STEEL CASTINGS

National Roll & Foundry Division

Avonmore (Westmoreland County) Pennsylvania

General Steel Castings Corporation: General Offices, Granite City, Ill.

Plants: Granite City, Ill.—Eddystone, Pa.—Avonmore, Pa.

this 140-TON horizontal milling machine

There's never been one like it before!

Just a press of a button puts this mighty Schiess into action. A 25-ft. high column moves smoothly along 45-ft. long bedways. Never a vibration—no chatter—even at maximum transversal loads! The new Schiess design of the spindle heads has eliminated this!

THE MILLING OPERATION. A huge tungsten-carbide cutter in a 14¼" spindle goes to work on the stock. And performs its operation with a consistent accuracy—a surface-finish count—never before obtainable on such a big fellow.

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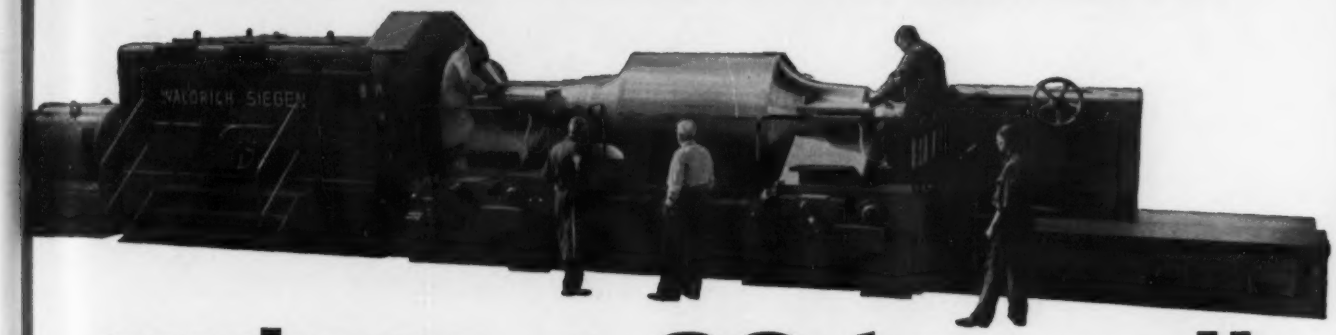
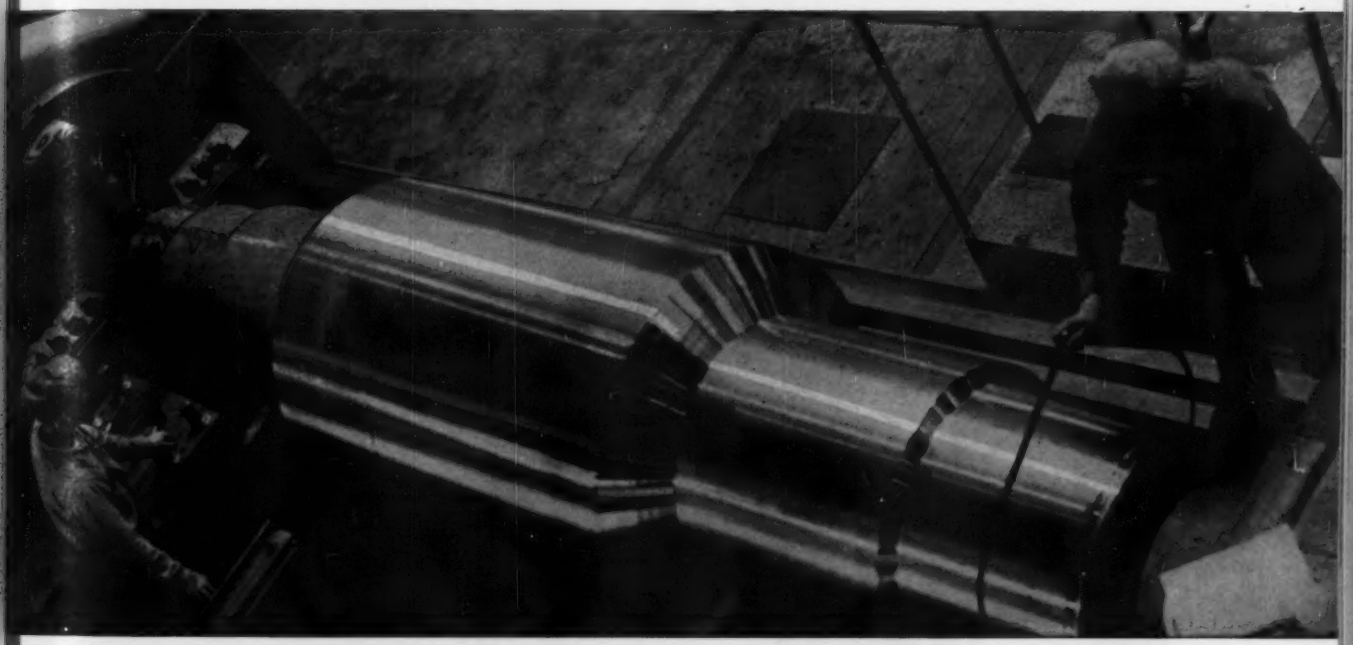


swings a 90-ton roll



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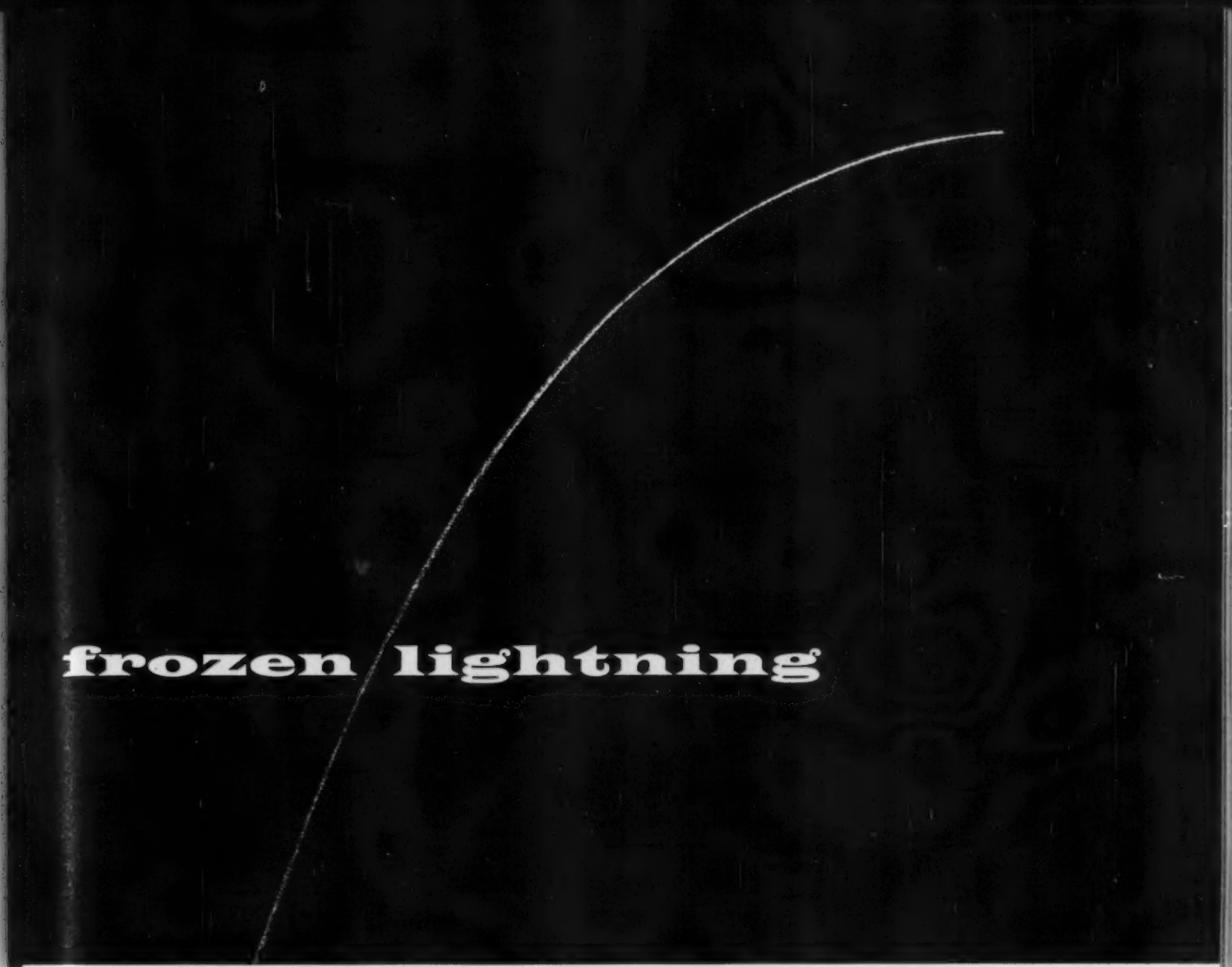

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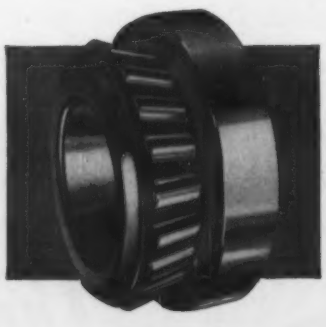

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... And as a manufacturer don't you find imports and substitutes grabbing more and more of your markets every day? Largely on a price basis?

Any connection between antiquated lathes and lost markets? You know it!

Consider these alarming facts. In 1945, 38% of all America's machine tools were ten years old or older. In 1953, 55%. In 1958, 60%. Yes, 60%!

The lathe story is even more disturbing. Right now 72% of all engine lathes are over 10 years old. Almost 40% of these are over 20 years old.

Think of that in terms of productivity. A twenty-year old 16″ slowpoke, with a 7½ H.P. motor, delivers a top metal removal rate of 9½ cubic inches per minute. A ten-year old with 10 H.P. delivers a 15 cubic inch rate. *And yet today's Monarch 20 H.P. job throws chips at a 36 cubic inch rate.*

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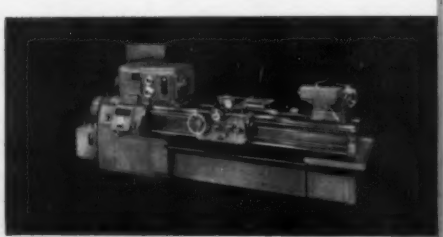
As never before, American industry must today study every avenue of possible cost reduction. For some, it may be a matter of sheer survival. Ancient lathes will not help meet tomorrow's competition. Modern Monarchs will ... *The Monarch Machine Tool Company,* Sidney, Ohio.



Not one of these MODERN MONARCHS was available 5 years ago. Some, not even a year ago.

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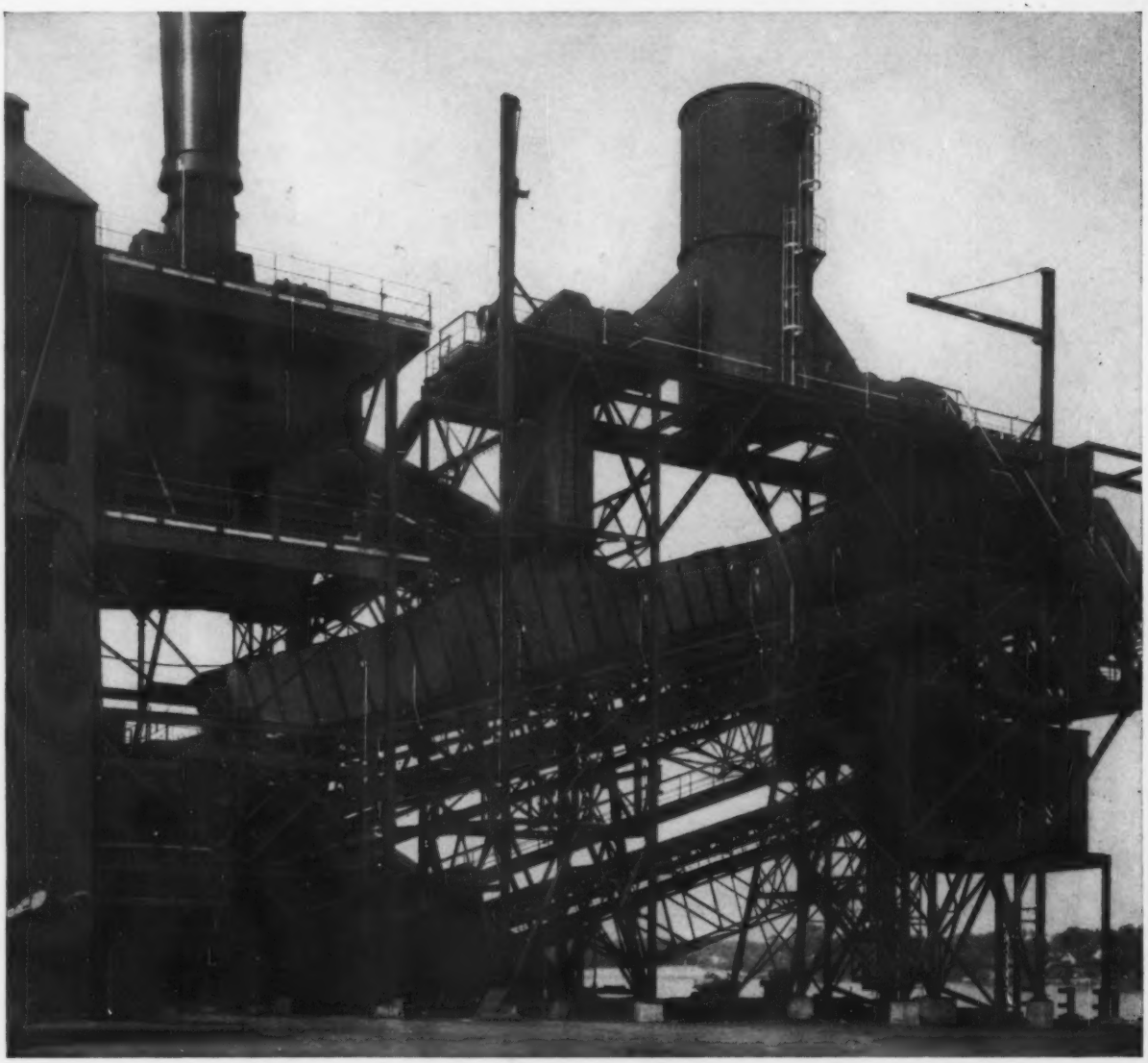

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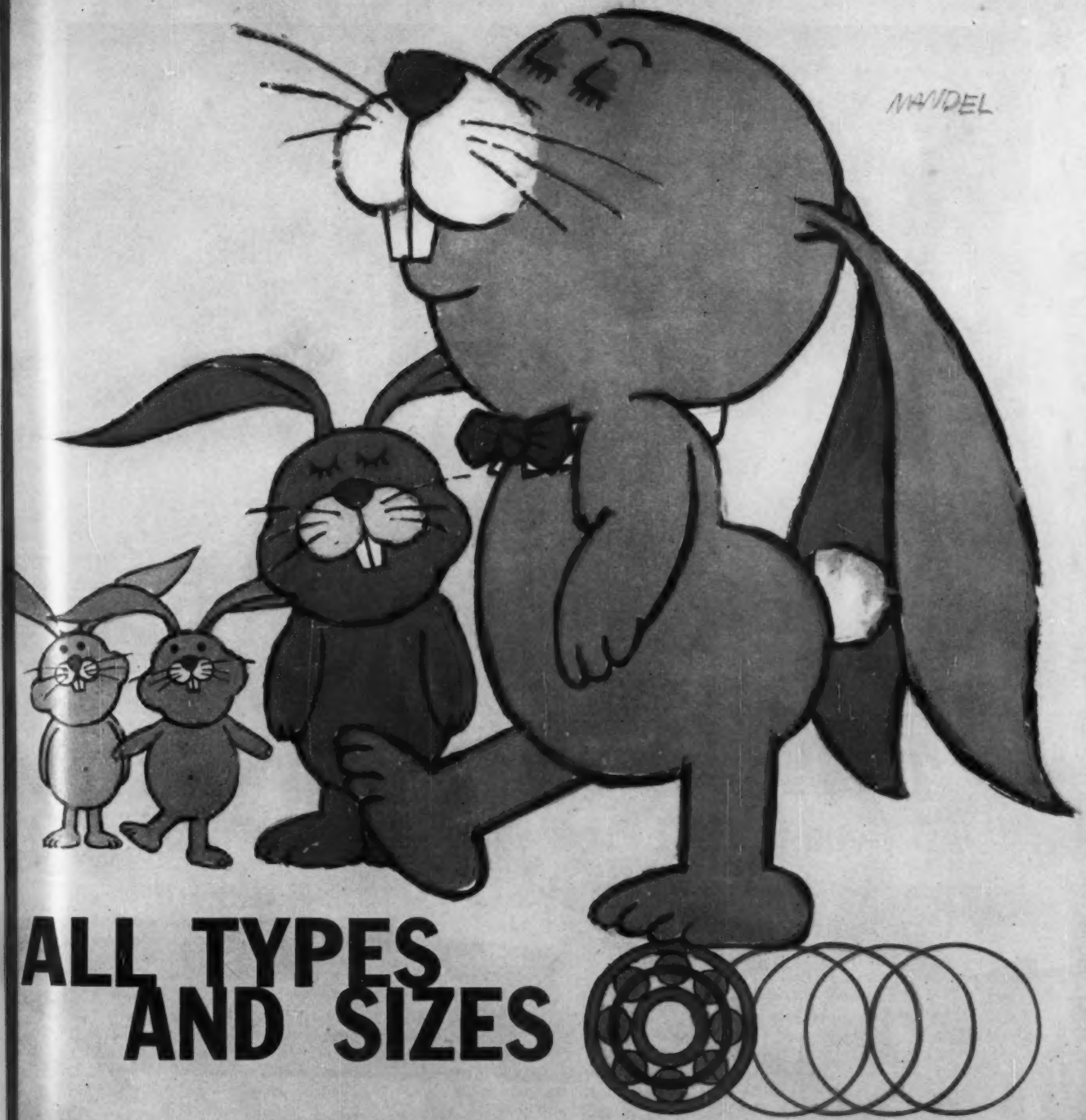

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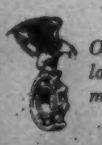

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Thanks to American Optical's new Thermalair Respirator and Aluminized Clothing, this man can now do a productive job in temperatures which formerly would have felled him. Application above is a kiln which man enters 4 or 5 times a day for about ten minutes to check moisture content of lumber. The safety director commented: "We tried going in without the respirator and couldn't get past the door."

The AO Thermalair Respirator (the only one of its kind) protects against heat *up to 300°F.* It was developed for use in ovens, kilns, furnaces and dryers when workers must enter these areas for product control, repairs and maintenance. *Here's how the respirator works:* Using the heat exchanger principle, as wearer inhales, heat is removed from incoming air and temporarily stored in the cartridge (not in wearer's respiratory passages). As wearer exhales, the stored heat is expelled from cartridge to the outside air. QUICK FACTS: A great health, time and money saver . . . permits freedom of work movement (no bulky equipment) . . . protects in sub-freezing as well as excessively hot atmospheres.

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NOTE: The Hood and Aluminized Window on wearer in photo were developed by AO especially.

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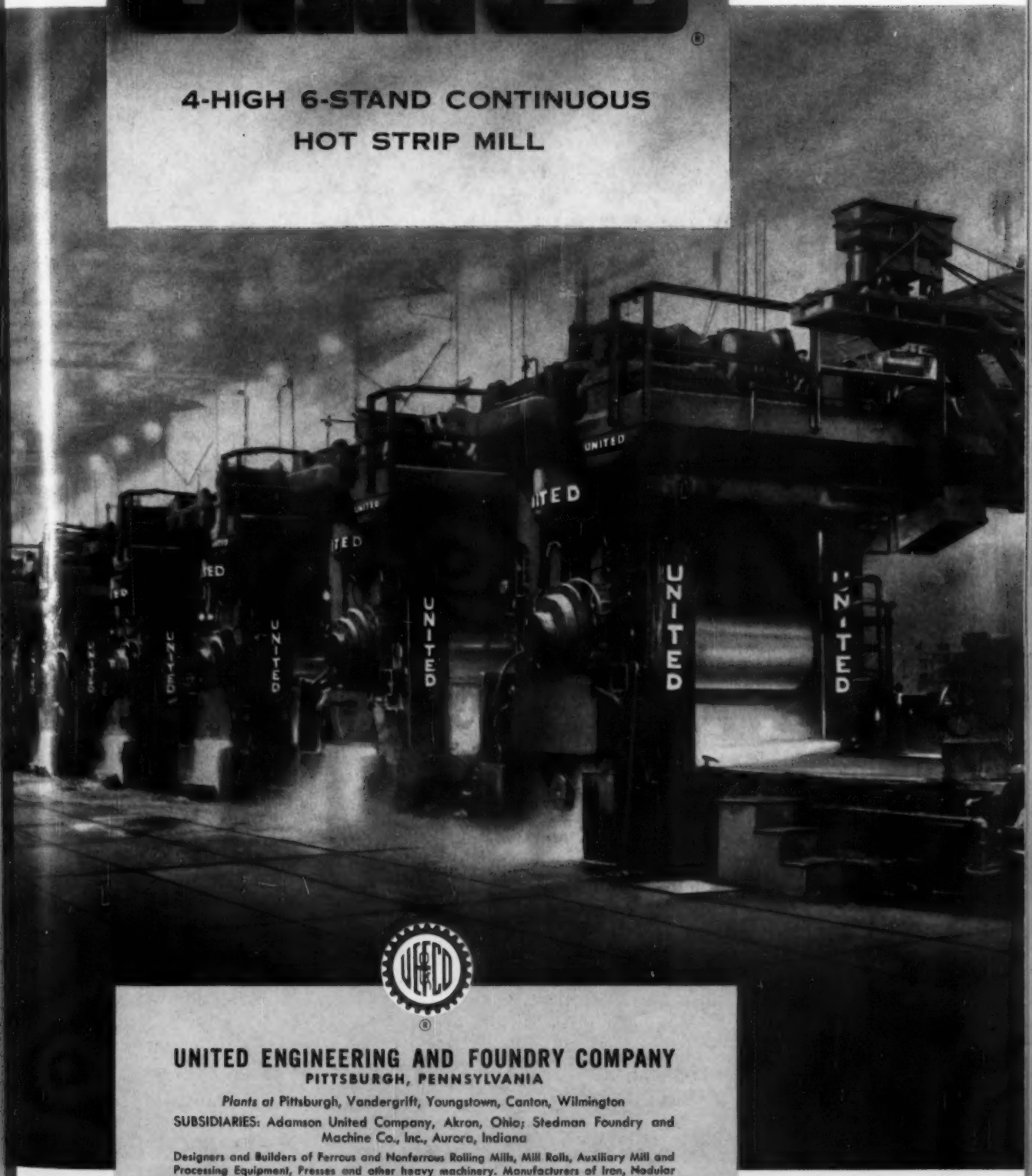

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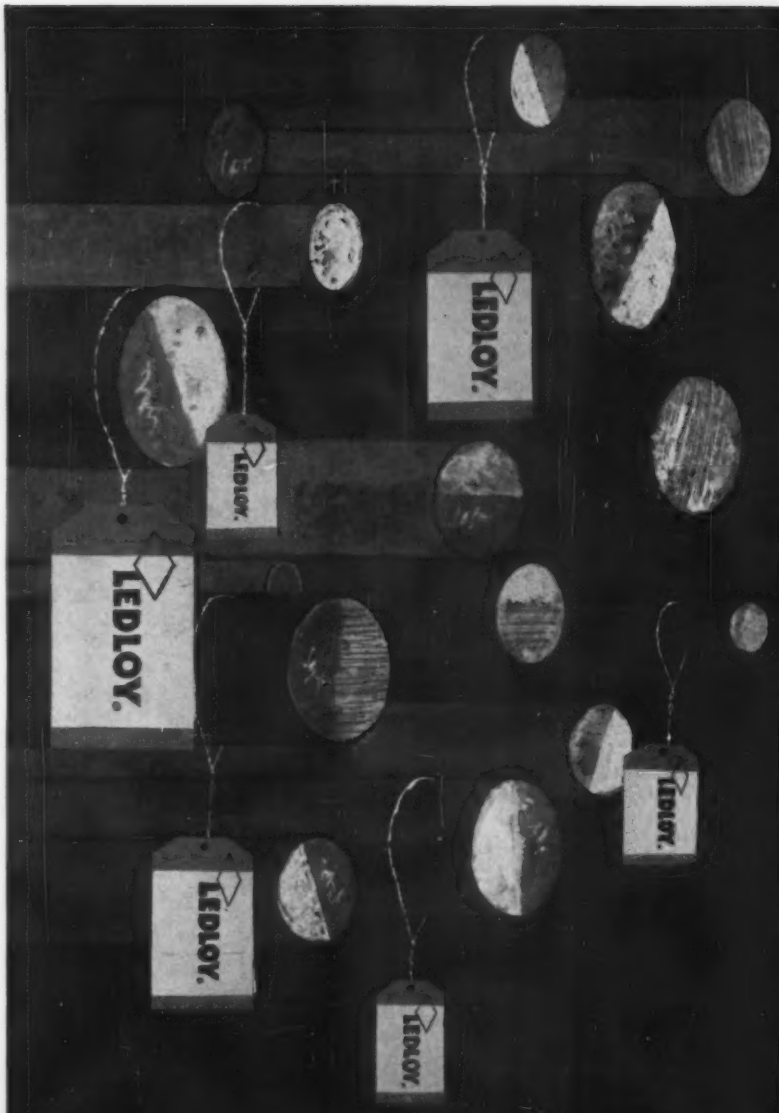

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INLAND LEDLOY steels are available in a wide range of standard carbon and alloy grades in bars or plates from your Cold Drawer or Steel Service Center. See them for LEDLOY and write to Inland for the booklet, "Properties of Inland Ledloy Steels".

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THE LONG-TERM STEEL STRIKE EFFECTS are now becoming evident. Steel users will have trouble obtaining all the steel they want well into next summer. This means some business loss for manufacturers who are unable to offer the right product at the right time. Auto and household equipment makers may be the hardest hit.

CRYOGENICS, OR LOW TEMPERATURE APPLICATIONS, is coming into its own in industry. And it's creating new markets. Aluminum makers, who point to their product's behavior at low temperatures, believe this field will yield a market of 30 million lb per year by 1965.

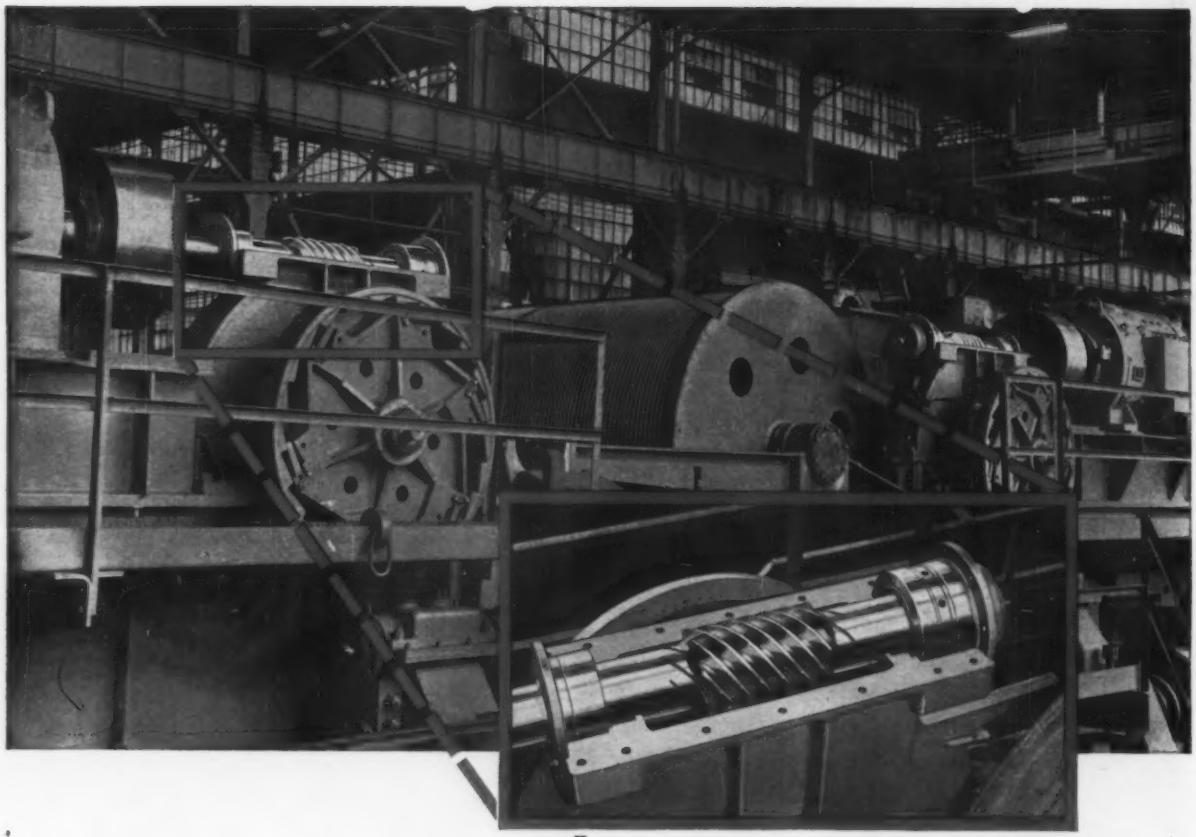
DEVELOPMENT OF CURTAIN WALL MATERIALS at comparatively low prices has widened the curtain wall market into the industrial field. Even small builders are taking an active interest in the comparatively new building product. As a result, the curtain wall market may reach the $500 million to $1 billion annual market area in the next decade.

ELECTRIC HOUSE HEATING IS THE SUBJECT of two research studies made for the electrical industry by independent research organizations. Both agree that future work must concentrate on the heat storage problem. A heat pump teamed with storage of a fairly small amount of heat to cover the worst winter weather might do the job, researchers indicate.

THE BIG WORLD AUTO MARKET in the next 15 years may be in Europe, according to L. L. Colbert, Chrysler president. Europe's market condition of one car for 10 people today leaves much room for market growth as European standards of living improve.

LOOK FOR INVENTORY BUILDUPS in other than steel later this year. Many manufacturers have let other stocks slump along with their steel supplies since the strike started back in July. Members of the National Association of Purchasing Agents report that not since July of 1958 have their stocks been so low.

AIRCRAFT STILL TAKE UP the biggest single share of Federal spending for air and space projects. Aerospace Industries Assn. says that of the $15 billion appropriated by Congress for these projects, $6.057 billion was appropriated for aircraft. This sum, along with funds holding over from previous years, will buy about 1500 aircraft.



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The Strike's Full Impact: It Hits Many; Will Last Years

Effects of the steel strike are far-reaching. They extend through markets, labor relations, even into government.

Failure of early attempts to avoid it now appear tragic in review.—By Tom Campbell

▪ The impact of the steel labor impasse will leave its mark for years on steel firms, the union, steel customers—and Government.

It is now definitely in the hands of the politicians. Labor and management have lost control of the eventual outcome.

Now, T-H—Shortly after President Eisenhower invoked the Taft-Hartley Act, the three-man fact-finding board disclosed some of its plans.

The board indicated it hoped to "legally" circumvent T-H in an attempt to get a negotiated settlement before an injunction is obtained.

A solution to the disagreement is not visible in any form. The economic difference between 7½¢ an hour per year wage cost (the companies' offer) and a minimum of 20¢ an hour wage cost (the union offer) is bad enough. But there is more than that.

"Never" Is a Long Time—Having jettisoned most of their famous "eight points," the steel firms will "never" give up their demands for contract language covering wildcat strike penalties and rewriting of local practices clause (2B) to obtain efficient operations.

The union will "never" give in to the suggested language covering 2B and wildcat strike penalties. That goes for union members from David J. McDonald, their president, to rank and filers.

Approaches for an agreement between the steel firms and the union are exhausted. Bitterness generated on both sides is deep. It will be lasting. It has seeped to the furthermost corners of mill towns.

Early Attempt—In the spring of 1958 an effort was made by steel labor and management to head off this showdown fight. Neither side had any success communicating with the other—even though they met face to face. A year later (May of this year) another approach was made by an industrialist to convince Dave McDonald that the union would not get a repeat of the 1956 steel agreement. That failed. The union officials didn't "get the message."

A few weeks before the steel strike and again shortly before the

"The Toughest and Roughest"

Tom Campbell, IRON AGE Editor-in-Chief, has covered the steel negotiations personally and continuously since they got under way back in April.

He scored the first major news beat of the negotiations by disclosing the steel industry's mutual assistance pact. (IRON AGE, May 7.) Since then, he has continued to keep IRON AGE readers informed on the latest inside developments, and their significance.

The veteran editor and labor expert was present and reported the formation of the United Steel Workers of America in 1936. He has reported every steel strike and negotiation since 1937.

After the last steel strike in 1956, Tom anticipated the bitterness that could arise when the two-year contract expired. He started laying the groundwork for reporting this negotiation immediately after the settlement two years ago.

How does this year's strike compare with others?

"This is the toughest and the roughest steel labor hassle I have ever covered or expected to cover," he says. "It has all the earmarks of a crusade and the emotional impact of a holy war."

THE OPPONENTS: It's probably unavoidable under the trying circumstances of the drawn-out, pressure-packed talk. But personal animosity building up between Steelworkers' David J. McDonald, left, and R. Conrad Cooper, U. S. Steel vice president and chief negotiator, isn't helping.

walkout, secret conferences were held involving Vice President Nixon, Labor Secretary Mitchell, Dave McDonald and industry advocates. At first these appeared to bear fruit. That was the major reason why The IRON AGE at that time looked for a settlement without a strike unless "haggling and bumbling" caused a breakdown.

Once the breakdown occurred and the strike started, there was never any real chance that both sides would see eye to eye. The terms of settlement advanced by both sides last week in Pittsburgh were little different than both had in mind before the strike started.

All steel consumers will feel the effects of this steel impasse on their supplies well into July 1960. Loss of business due to consumer inability to get the manufactured item when wanted is anyone's guess. But the household items and autos may be hardest hit.

Tough Times Ahead—Steel companies involved in the strike will see a vast change in their selling methods. When the mills reopen, the rancor and vigor of competition will be bareknuckle. The solidarity of the 12 firms on their labor problem is completely divorced from what they will do to each other, competitively, once steel is being made—and shipped.

Cash flow among steel firms will be needed badly. Many capital expenditures which had been a certainty may be postponed for the time being.

On the Ballot—No one can now predict what big steel users will be saying if a second strike comes in January, in case the injunction runs that long. Steel firms are now busy trying to get their demands down in plain English for an expected National Labor Relations Board ballot for striking employees at an election between the 60th and 75th day of Taft-Hartley, if invoked that long. Steel officials, who are not shaking hands with themselves, concede that the election will be a choice between the union and management—with the union winning out.

In neither camp is there any idea of how this holy war with its crusade implications will be solved. Outside industrial relations experts are flabbergasted. None, of any repute, expected the present outcome. But it is here.

Reputations at Stake—Two reputations hang on the outcome of this fight. Some steel men are quick to point out privately that Dave McDonald is "done." That is wishful thinking or indicates ignorance of union thinking. Mr. McDonald knows as well as anyone else what a chance he is taking in this fight to the finish. What's more, in his own mind he undoubtedly thinks he ought to be through if he has to take the latest offer of the 12 firms. And there won't be any other.

Roger Blough, U. S. Steel's board chairman, has a lot at stake in this crusade to stem inflation and to hand back to his management things he feels they have lost in the shuffle over the past 15 years or so. He has been the power behind the scenes. The other 11 company heads have looked to him as man in charge of the dug-in position. While they have talked and presented their opinions, it would be less than realistic to assume that the final decision has not had the U. S. Steel label on it—backed solidly by the other 11 companies and with special emphasis from Bethlehem Steel and Republic Steel. Smaller firms in the group which couldn't possibly absorb a high wage increase without a price increase are solidly behind the reasoning for economic reasons. There won't be a price increase.

Future Fears—Labor courts are now a probability in five years or so. Legislated collective bargaining is just around the corner. Employee bitterness is a fact and will remain with us for some time.

Other employers, seeing the strong steel stand, will emulate it. Other unions seeing Dave McDonald's plight will say, "There go I," and dig in to help by any means possible.

"Right to Manage" Is Key Issue

Labor Experts Say It's Essential to Success

Labor relations experts agree management, not unions, must run a company or it will fail.

This means they must often take a tough stand or forfeit their prerogatives. — By T. M. Rohan.

▪ The topic, "Regaining the Right to Manage," proved irresistible to Cleveland area labor relations men last week. And a record, overflow crowd of over 600 showed up for the 12th annual fall conference of Associated Industries.

With the steel industry taking a monumental strike to regain management rights, last year's tactical victory in the auto industry, and other skirmishes, the thumping of chests was extensive. And the labor relations men inhaled the heady atmosphere with gusto.

Manage or Lose Out—"The right to manage is essential if a business is to remain successful," said H. D. Garrett of General Motors Corp.'s Detroit labor relations staff.

"If the right has been lost, it must be regained. If it has not been lost, it must be maintained against constant union efforts to diminish it. The certain alternative is that the enterprise will eventually go under."

He believes other companies have been more reluctant to stand up to the discipline problem and now have more wildcats.

Guards Prerogatives—At Massey-Ferguson, Ltd., Toronto, where management scored a strike victory in January, the company jealously guards what it considers its prerogatives.

"A management that is not prepared to face a strike in order to defend its rights will ultimately forfeit them if it is dealing with a militant union," the company says.

Controversial Method — G. R. Koons, industrial relations director for Carter Carburetor, St. Louis, spelled out some ground rules for bargaining which caused a controversy.

Mr. Koons said that when the company seeks to change a clause in its contract, informal conferences are held with the union ahead of negotiation. The proposal is explained then, rather than sprung during contract talks.

Militant Always There — "Of course, this gives the militant segment of the opposition time to work on it," he admitted. "But we feel the militant people will always be there anyway. By giving the company side early we can win some support and at least thoughtful consideration."

Ground rules for bargaining suggested by Mr. Koons are: Don't violate confidences in group sessions. Don't renege on "smoke signals." Don't "soft pedal" one issue as a small one, then spring it as a big one. And don't agree in principle, then insist on vague language.

What They Asked the Experts

Questions from the floor traditionally highlight AIC labor forums. Here are some of the typical questions, and the answers.

Q. Why don't you sue unions for damages for wildcat strikes?

A. "From a theoretical viewpoint, it's possible and we may get to it. But it's a little like trying to live with your divorced wife. It would take a long, long time to get over the bad feeling."

Q. What do you do to a worker who refuses to work overtime?

A. "We will take disciplinary action including up to a 30-day layoff for those with a record. We consider up to eight hours per week reasonable overtime." — **Harry Garrett, General Motors**

Q. Why won't you negotiate engineering standards?

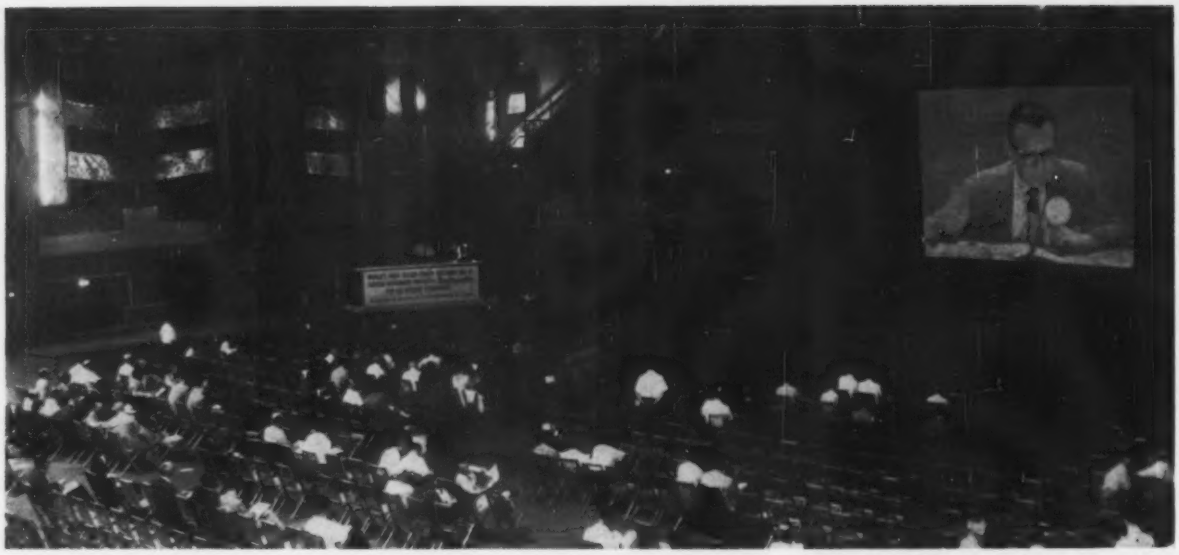
A. "We simply will not allow discussion of engineered standards as a proper subject for labor. Standards are made by humans and subject to some error. If we allowed discussion of them we might as well throw out our time study and rate setting departments, because we'd put such a hole under them they'd never get out."—**Harold Wallace, Massey Ferguson Ltd.**

Q. Why can't we call a union witness?

A. "You can't really compel them to appear because if they did, there would be an inference they were joining the company side. This would so ostracize them that they would probably have to leave the job, maybe the area. For a $100,000 case it might be worth it, but not much less."

Q. What about past practice?

A. "Past practice comes up when you have sloppy language and have to go into the past to find out what was meant. The whole thing should be in the contract and not governed by any past practice. General Motors even stipulates 'this is the entire contract' and that's the way to do it."—**Whitley P. McCoy, Labor Arbitrator**



BIDDING SITE: Bidders sit in Philadelphia bidding on materials seen on the closed-circuit TV screen.

TV Brings Higher Auction Prices

The Government used closed-circuit television to get higher prices for surplus goods.

Buyers are enthusiastic and are looking forward to more TV use in auctions. — By M. J. Tatich.

▪ The government turned to closed-circuit television last week to get back a higher percentage of original costs on surplus goods.

Using the facilities of TelePrompter Corp., approximately $2.5 million worth of surplus equipment was auctioned via closed-circuit TV. The return was over 20 pct of original acquisition cost. Return usually ranges between 12 and 14 pct.

This new high practically guarantees closed-circuit TV use in future government surplus auctions.

Covers Large Territory—One of TV's biggest assets is that it covers a large territory simultaneously. The telecast originated from the Philadelphia Naval Base, Shelby (O.) Air Force Base, and Granite City, Ill., Army Engineers Depot.

But instead of the bidders being confined to one of the auction sites, they sat in bidding rooms in Philadelphia, New York, Boston, Columbus, Chicago or St. Louis. Here they saw the equipment offered for sale on huge screens and were able to bid against buyers at the other locations.

Early bidding on used machinery was slow, but after bidders accustomed themselves to the new method, bidding began, and remained, at a rapid pace.

Buyers Enthused—Buyers were enthusiastic about closed-circuit TV auctions. Several said they were looking forward to more of them.

Army Quartermaster General Andrew T. McNamara said if the idea is as feasible as it appeared, closed-circuit TV would "have to be considered" in future auctions of government property. "It is a faster method of moving a great variety of equipment and will get dollars back to the public more quickly," he said.

Money Well Spent—The cost of the telecast was $81,000. And Gen. McNamara said the money was well spent.

Some of the greatest return came from heavy equipment. Cranes, bulldozers, etc. were bid to as high as 30 and 40 pct of original cost.

After detailed planning, the operation only took one day to set up. All points were connected to a radio-central point at the American Broadcasting Co. in New York. As fast as bids were called out in one location they were instantly heard in the other five. This afforded fast bidding and moved the sale at a fast pace. Nine auctioneers of the J. S. Boneparth & Sons, New York, handled the bidding.

Big Future — Irving B. Kahn, TelePrompter president, said the future use of closed-circuit TV in auctions was unlimited. He said his firm is looking for a big increase in the auction business.

He said industry was also making greater use of the closed-circuit system. Several large corporations use it for meetings and conferences when it would be impractical to bring large groups together.

Aluminum Hot in Cold Market

Cryogenics – Ultra-Cold Uses – Will Jump 1000 Pct

This market is growing by leaps and bounds, and aluminum has the inside track.

It's one of the few metals that isn't brittle at very low temperatures.—By G. G. Carr.

▪ Aluminum producers are getting set for a real chill—and they couldn't be happier.

The chill is cryogenics, or methods of producing low temperatures, close to absolute zero. More industrial applications of this science will boost low-temperature aluminum markets from a current three million lb annually to 30 million lb by 1965, predicts Reynolds Metals Co.

Front Runner—One factor that will help aluminum's growth in this market: It has no strong competition now, although other metals are working in this field. Most steels, and other materials tried, become brittle at a very low temperature.

Aluminum keeps its usual ductility and shock resistance at very low temperatures, while its strength actually increases as the thermometer drops. This, and aluminum's thermal conductivity, light weight and low maintenance, give the metal real advantages as a construction material for low temperature equipment, declares E. V. Wilber, Aluminum Co. of America vice president and treasurer.

In addition, aluminum can often offer price advantages over other mechanically suitable materials.

Cold Markets—Where will aluminum be used in cryogenics?

Aluminum, Mr. Wilbur points out, is already being used extensively in equipment producing oxygen in large quantities.

Use in liquified methane processing and transporting is still small, but may prove to be the largest single new market for aluminum to come along in many years, says Reynolds.

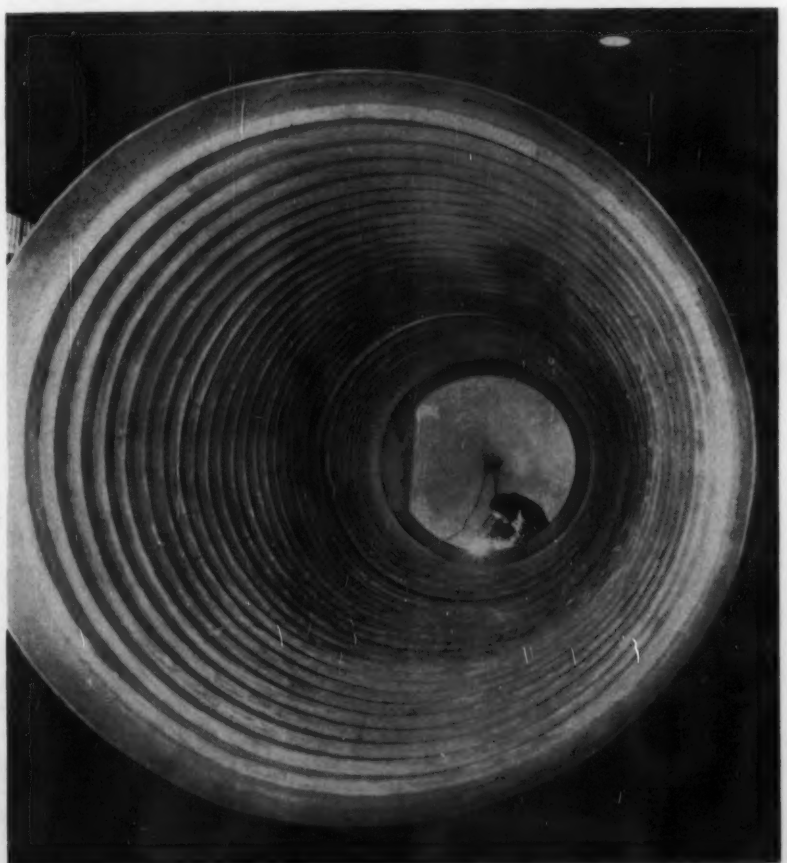
Biggest immediate low temperature applications are in chemical and related process industries.

Electric and Electronics — Electrical companies are trying very low temperatures to develop refrigerators and air conditioners with no moving parts.

Electronics designers are already exploiting the super-conductivity of tiny parts at low temperatures.

And the aluminum industry is excited about power applications. In the nuclear ship Savannah, a gas purification bed uses only two lb of charcoal to do a job that formerly took 2000 lb. Super-cooling of the bed uses energy from nearly all the combustion by-products, many of which would normally be lost.

Current Customers—Specific low temperature equipment now using large tonnages of aluminum includes reversing heat exchangers, low and high pressure fractionating columns, distillation towers, evaporators, condensors, filters, air coolers, reboilers, air expanders.



ULTRA-COLD: Cryogenics example: This all-welded aluminum low pressure tower will be subjected to constant temperatures around —320 degrees F at an air separation plant. (Alcoa Photo)

Curtain Wall Goes Industrial

Fabricators Get Strong Foothold in Market

As industrial building moves at strong pace, curtain wall fabricators are taking a bigger share of the market.

Porcelain enameled steel is most popular type of construction.—By K. W. Bennett.

▪ The industrial market for curtain wall makers has long looked attractive. But now the promise is coming true.

Curtain wall fabricators expect strong sales in the industrial field this year and next.

Five Year Wait—With reports that industrial building so far in 1959 is running 64 pct over 1958 levels of $2.3 billion, curtain wall fabricators are loaded for bear. The biggest building gains are in the field they've waited five years to tackle.

Estimates of the annual gain in curtain wall buildings from now on range from 15 pct to 30 pct a year. A Detroit fabricator reports: "Thus far 90 pct of the curtain wall buildings we're putting up are porcelain enameled steel. For the price we can build a curtain wall with this material, we're getting the small builders. We beat out a cinder block bid for a machining plant this year."

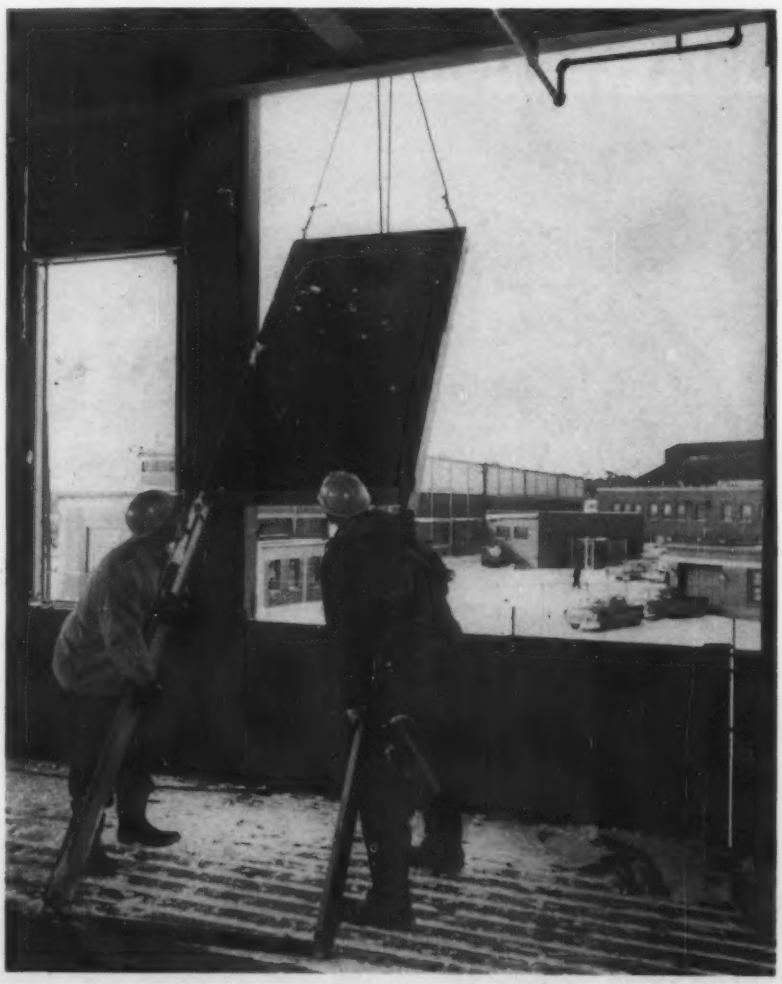
Sales Estimates — Another curtain wall panel fabricator says, "We'll increase sales by at least 15 pct again this year. Porcelain enamel curtain wall will be the biggest part of the gain. We figure we'll grow at this pace through 1960. Then we see an 18-month breathing space. Then we'll start growing again."

"We're using extruded aluminum for the grid (the vertical supports or mullions locking the wall panels in place) and porcelainized steel for the panels. We've made small plant bids as low as $2 to $3 a sq ft, using a standardized panel."

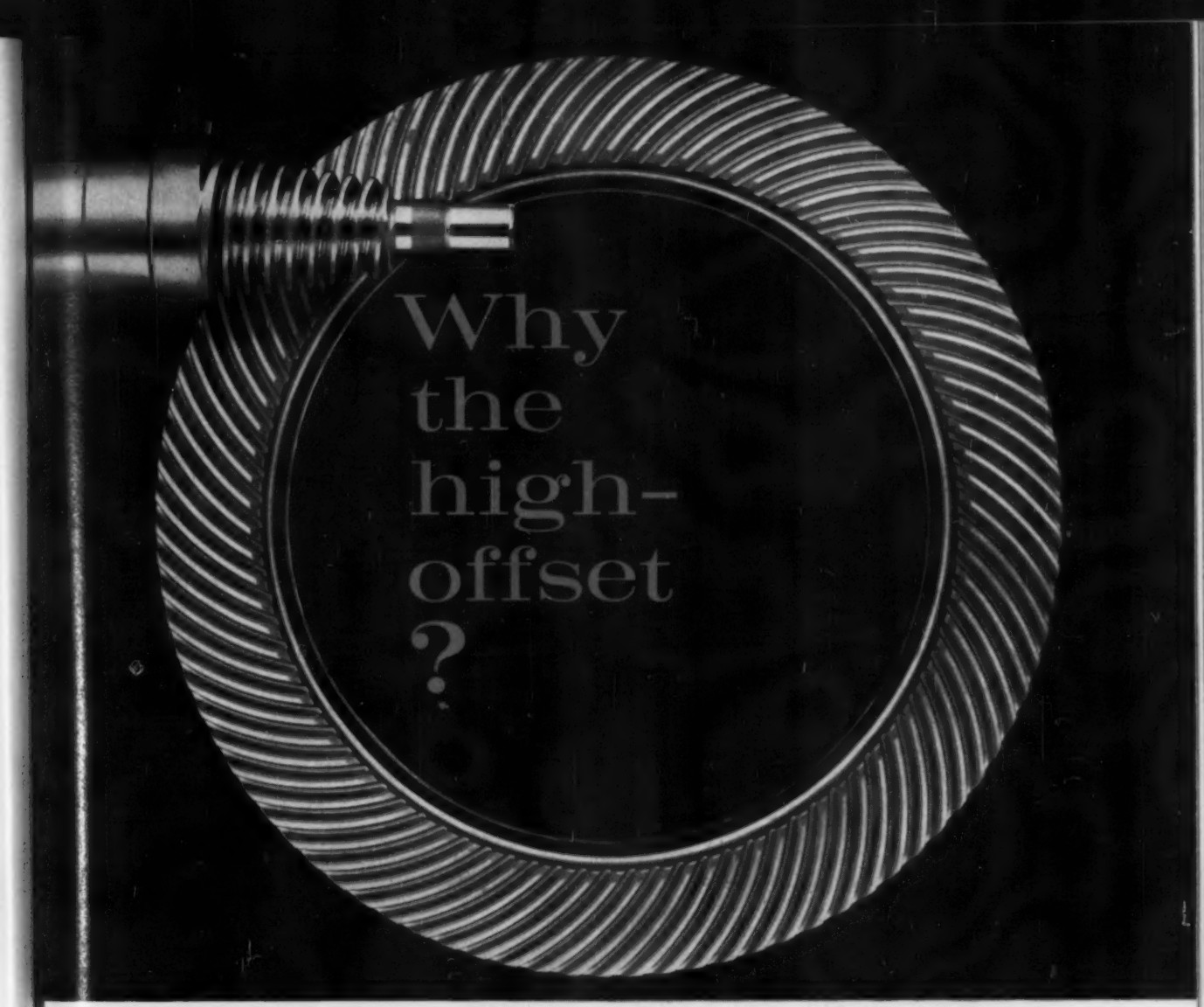
One company, R. C. Mahon, recently estimated the curtain wall market at $100 million a year, reaching $500 million in the next decade. Another—E. J. Grabowski, president of Lite-Wall Co., Detroit, comments, "I think the Detroit market alone is already at least $10 million a year."

Room for Everyone — So far, there's room for everybody in the market. One aluminum maker is betting curtain wall use of aluminum will double by 1963. A steelmaker centers his market analysis on buildings of $1 million or more in value.

He points out this market absorbed 8000 to 10,000 tons of stainless in 1957. It should absorb 25,000 to 30,000 tons of steel curtain wall panel this year and 75,000 to 100,000 tons by 1963.



GOING UP: Stainless steel curtain wall panels go up at Canada's Atlas Steel Co.'s new administration building at Welland, Ont.



...and where can you use it profitably?

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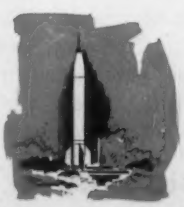
It's the difference that lets you combine *high-reduction* with strength, compactness and other advantages you might find profitable in certain applications. For instance . . .

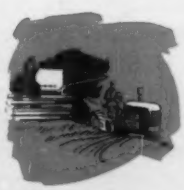
For smooth operation—as in office equipment that must run quietly—high-offset pairs provide smooth, quiet tooth action. Because the teeth "wrap around" the pinion, *you get continuous action—even with just one or two teeth.*

Where space is a problem—as in instrumentation—the high-offset lets you design a more compact unit. Choose just the offset to solve your design problem with a more flexible, more compact unit than the corresponding worm and wheel.



Where you need strength—as in farm machinery—high-offset hypoid pinions with teeth, which tend to "wrap around," are larger and stronger than corresponding bevel pinions.

High-offset or high-ratio hypoids can be cut on the same Gleason equipment that is used on more familiar spiral bevel and hypoid gears. You can also use the same testers, quenching presses and other auxiliary Gleason equipment you're using now. Grinders are available for applications requiring precision finish. For ratios of 1:10 or 1:40 or even higher.



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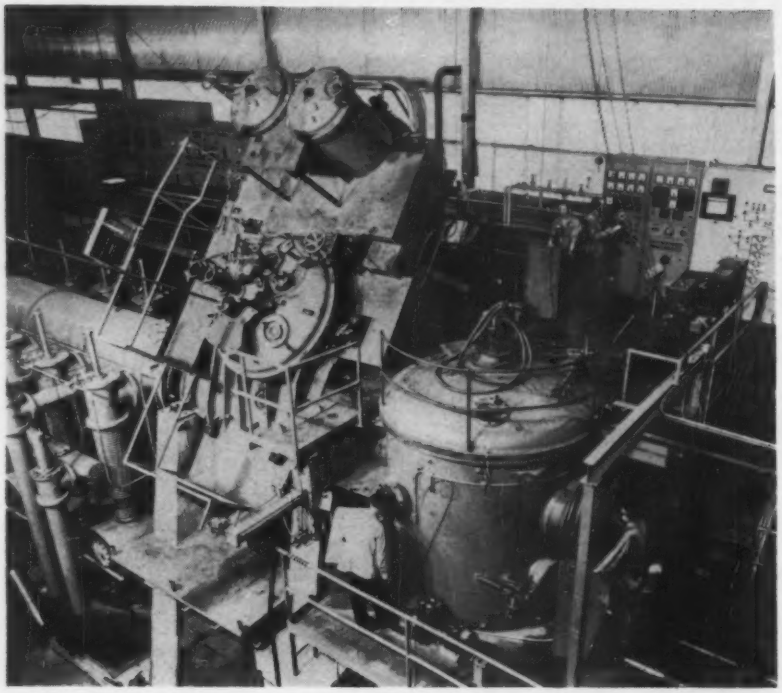

MADE IN SWEDEN: The Metals Div., Kelsey-Hayes Co., New Hartford, N. Y., has installed a new type vacuum induction furnace, designed and built by ASEA of Vasteras, Sweden. The 5000 lb capacity makes it one of the world's largest. One new feature: The entire melting chamber tilts to pour. Ingot size ranges between 200 and 5000 lb.

NLRB and Cross Await Court Ruling

The Cross Co., Frazer, Mich., strike-bound builder of automation equipment, and the National Labor Relations Board made an unprecedented court appearance in Cincinnati last week.

U. S. Sixth Circuit Court of Appeals denied Cross's bid to decertify UAW Local 155 as bargaining agent. NLRB can also go ahead with an unfair labor practice charge hearing that was pending the court's decision.

Importance Established—But the court-ordered hearing already has established its national importance (IRON AGE, Oct. 1, 1959, p. 43). The court set the hearing after Cross asked for a writ of mandamus to make NLRB order another union certification election at its plant.

It marks the first time that a U. S. court has reviewed a NLRB certification decision recognizing a union as representing the majority of workers for a company without unfair labor practice charges having been filed.

Judges Will Decide—There were no sworn witnesses or testimony at the Cincinnati hearing. Attorneys for both sides simply submitted written briefs and presented 45-minute arguments.

Big Seaway Cargo

Largest single shipment of machinery via the new St. Lawrence Seaway has left the Port of Milwaukee. The cargo is 100 Minneapolis-Moline tractors.

The tractors have a gross weight of 653,000 lb and occuy 22,300 cu ft of space. They are enroute to the Spanish Moline distributor at Madrid, Spain.

J. A. Frisz, export manager of M-M, notes: "The resurgence of export demand for high-powered American-built tractors in Europe is clearly evidenced by this important shipment, and proves again the superiority of American machinery."

NLRB Interprets New Labor Law

A union involved in a pending National Labor Relations Board representation election can ignore the old non-Communist affidavit requirement regardless of when the proceedings started.

The NLRB in a split 3-2 decision has held that the new labor reform law passed Sept. 14 removes the need for a union to file the affidavit in any pending case. It was the first Board interpretation of the new law.

Phoenix Asks Consent On British Credit

Phoenix Steel Corp. wants to act on a British offer to finance construction of its proposed steel mill in Burlington, N. J.

The offer would supply a $44 million credit, according to J. A. Sisto, chairman of the board of Phoenix. The financing would be provided by four British banks and guaranteed by the British government.

Mr. Sisto is asking company debenture holders for permission to modify the company's terms of indenture. Consent of two-thirds of debenture holders must be obtained before the offer can be accepted.

The new plant, to be located near the Delaware River, would have an estimated ingot capacity of 800,000 tons a year.

Two New Chevys

Chevrolet is adding two new lower-priced 1960 models to its 1960 line.

Six-cylinder Fleetmasters carry factory list prices of $2026 and $2076. This is $30 less than comparable models in the regular Biscayne series.

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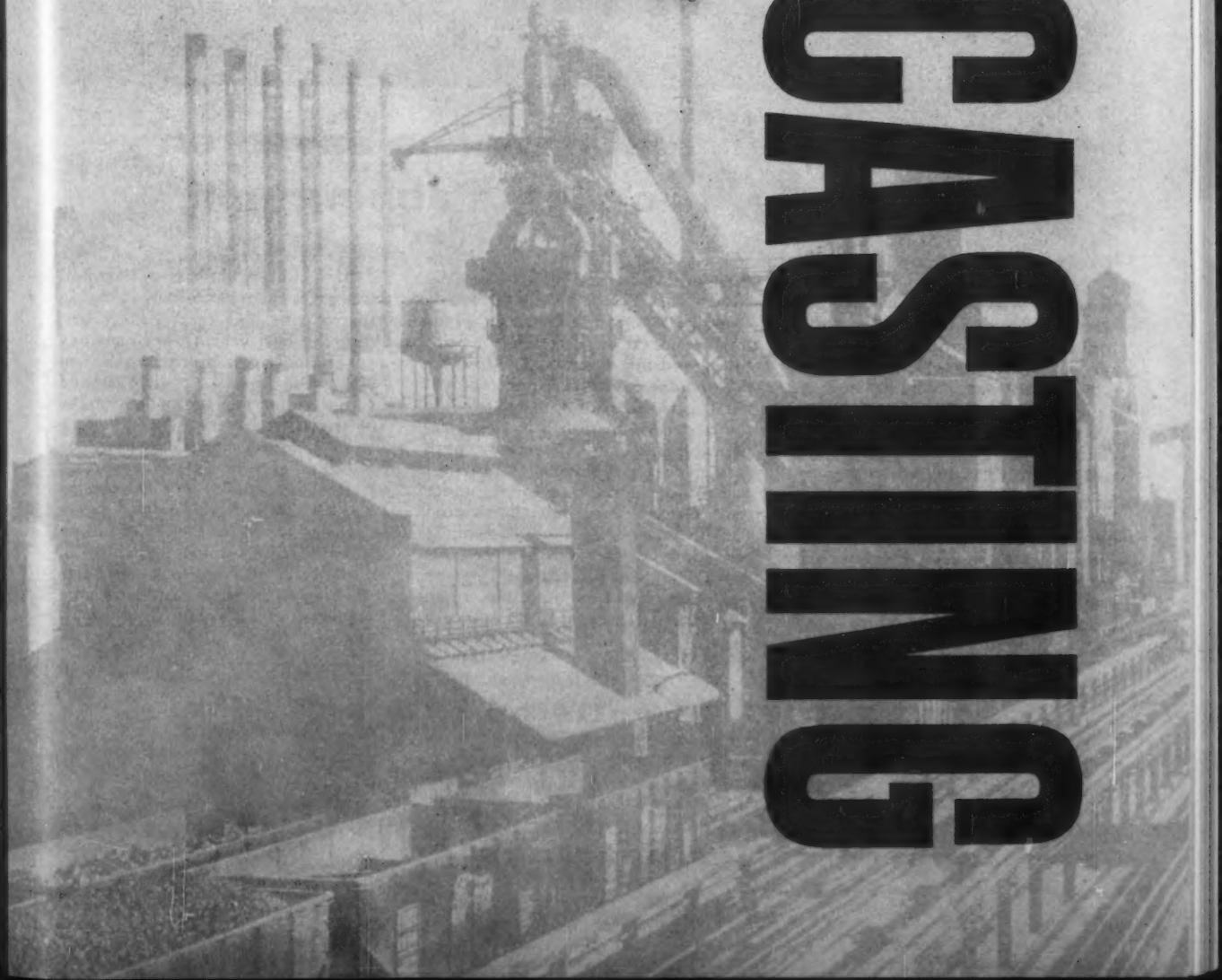

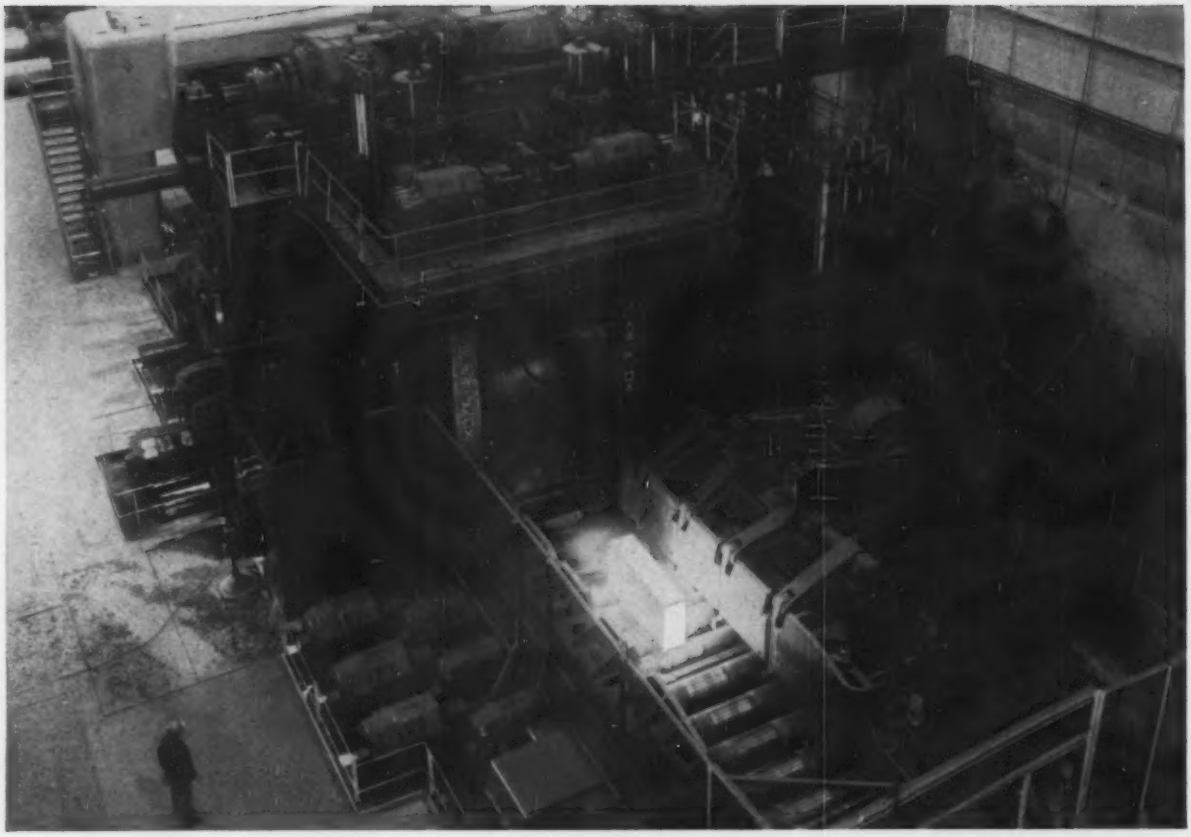

Time, power, maintenance saved on Blaw-Knox two-high slabbing mill

BLAW-KNOX wanted to be sure this new 46″ x 90″ 2-high slabbing mill would work steadily, economically, under tremendous shock loads. They mounted roll necks, screwdowns, edger, edger drives, table drives and table line shaft on Timken® tapered roller bearings.

Result: *Less downtime* in roll changes; the Timken bearings and roll assembly can be removed easily as a unit; *low starting resistance* and less power required because Timken bearings practically eliminate friction; *reduced maintenance* on screwdown and breaker block, because Timken bearings hold the upper roll in place, eliminating the "jump" when slab or bloom enters the mill.

More than 1,000 mill installations the world over use Timken roll neck bearings, 1) *To roll the load*—virtually eliminate friction. Timken bearings have tapered design to take both radial and thrust loads. 2) *Minimize maintenance:* Modern Timken roll neck bearings are designed to provide the best combination of bearing capacity, rigidity and roll neck strength for a given mill roll diameter. Bearings and roll necks stand up longer under load. Grease or oil mist lubrication provides further economies. And, 3) *give longer bearing life.* Mill records show that service life of Timken back-up roll bearings has been obtained in excess of 12,000,000 tons of steel rolled. They're case-carburized to take shock and the full-line contact between rollers and races gives them extra load-carrying capacity.

For the best bearing performance and engineering service when you build or buy a mill, specify Timken tapered roller bearings. They make any machine better. **When you buy Timken® bearings you get...** *1) Quality you can take for granted. 2) Service you can't get anywhere else. 3) The best-known name in bearings. 4) The pace setter in lower bearing costs.* The Timken Roller Bearing Company, Canton 6, Ohio. *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.* Canadian plant: St. Thomas, Ontario. Cable: "TIMROSCO".

BETTER-NESS rolls on

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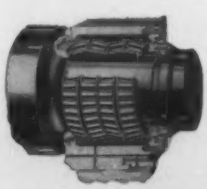


First in bearings for 60 years

Joseph Martino

A Top Man's Climb to the Top

Joseph Martino started working as a $4.50-a-week office boy. Today he is president of the company.

He has worked to expand National Lead Co. and to further research and development in new fields.

JOSEPH MARTINO: Politics helped develop the business mind.

▪ In 1916 Joseph Martino, an eager 16-year-old, reported for work at 111 Broadway, on the fringe of New York City's financial district. United Lead Co. was paying him $4.50 per week as an office boy.

Today, Joseph A. Martino, still eager, still works at 111 Broadway. Now he is president of National Lead Co., which absorbed United in 1928. His company consistently tops a half billion dollars in sales annually.

His whole life has been wrapped up in National Lead. Yet Joseph Martino found the key factor for his Horatio Alger type rise outside of his company.

Political Fever—As a young man Joseph Martino was "crazy" about politics. He worked actively in the Democratic party on Al Smith's campaign for president, Jimmy Walker's election as mayor of New York City, and many other political battles.

He almost made politics his career. But the lure of National Lead Co. and the business world was too much. But as much as he gave to politics Joseph Martino took more in return. He learned to meet people, understand their wants, and what makes them tick.

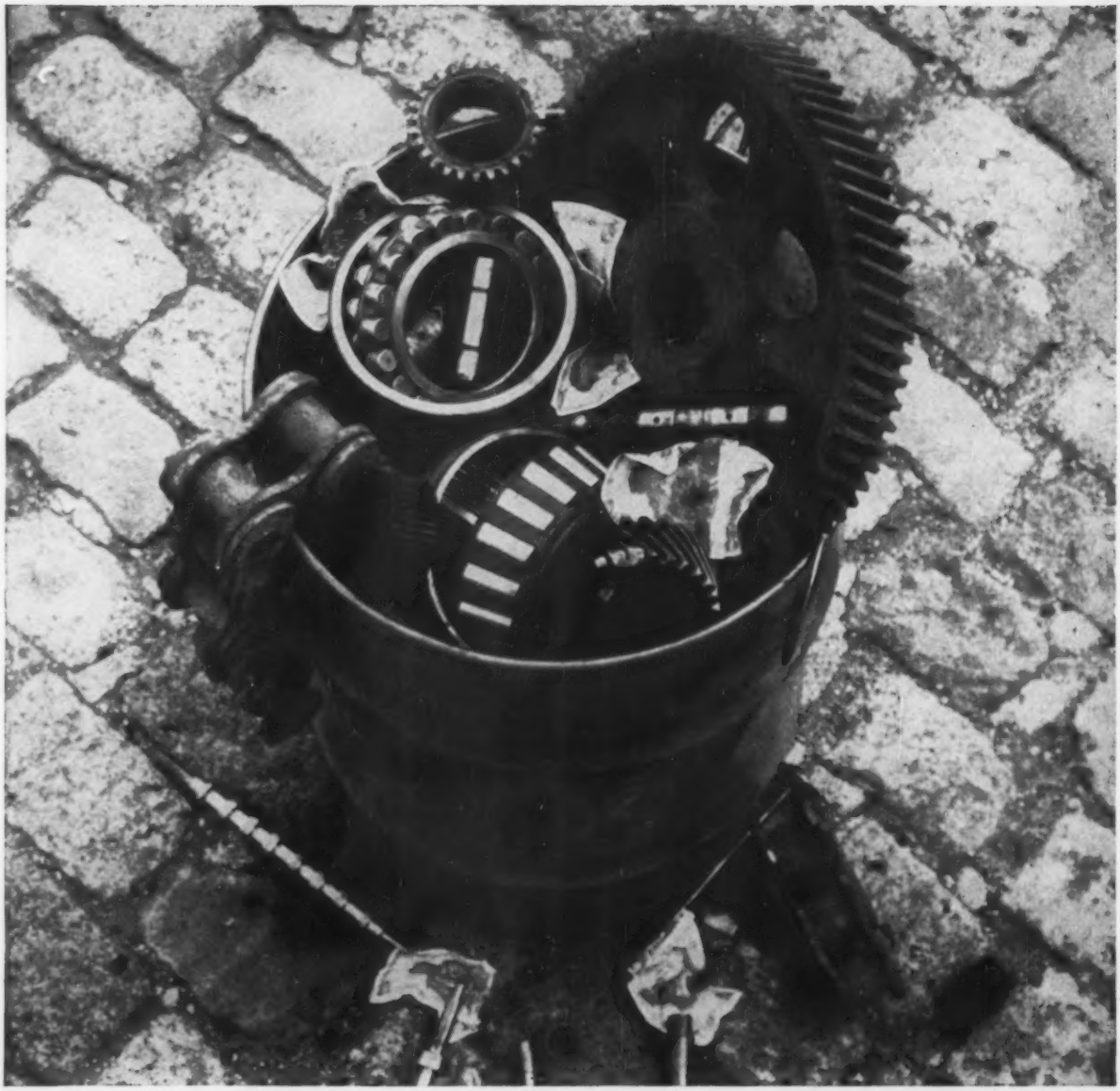
Says Joseph Martino, "Without this, I don't think my company would be on top today. It's the political side of me that enables me to do the job."

The Financial Side—But there's more to the Martino story than just a way with people. From office boy, Joseph Martino went into the accounting department. He moved up on the "money side of the business." He became facile with the large figures of major corporations. But more important, he learned the importance of profit margins.

When Joseph Martino ascended to the presidency, National Lead Co. was almost entirely in the business of supplying lead for paints. Now, the company produces over 150 basic products and hundreds of derivatives, operates plants in 32 states, and has holdings in eight foreign countries.

Varied Products—National is still in paint, but now it sells its own under the Dutch Boy label. But this is only 40 pct of the business. Metal product fabrication accounts for 20 pct of sales, diecastings 14 pct, drilling muds and services for the oil industry 11 pct, bearings 6 pct, and the rest is a list of miscellaneous items including screws, refractories, alloys, zirconium and titanium.

In fact, National Lead will buy a company or start its own in almost any line. The big criteria is that it must at least show promise of returning a profit no less than Mr. Martino's standard—a fat 10 pct.



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LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

Strike's Economic Effects Spread

Broadening effects of the steel strike are spreading wider than expected.

Many sections of the economy feel the growing strain of the long shutdown.

▪ When the steel strike began, much was made over its limited effect on the economy.

Aside from what happened to steel and related industries such as mining, shipping, and transportation, the initial impact was not great. Industrial output slid off a little. But steel stockpiles were large and production stayed at high levels.

Except for the metal and auto industries, output was higher in July and August than it was in June. Producers of durable goods kept operating at peak rates, getting ready for a busy fall. Consumer income and demand remained high.

Too Much, Too Long—But as time went by without a settlement the balance started swinging the other way.

Business now realizes the economic hangover from the strike will be worse than expected. Steel supplies are about exhausted. Idleness in steel-using industries is climbing.

Even re-opening the mills can't end steel supply problems. Manufacturers producing consumer durables for the fall buying season will be scrambling for steel for months.

Both the lack of steel and reduced buyer interest may be disastrous to auto producers going all-out to promote 1960 models.

Widening Troubles—Like widening ripples, the strike's effects keep reaching out to new areas. Each shutdown or loss of wages generates others in a chain reaction.

Builders feel that strike-caused delays may dampen construction enthusiasm. Railroads and truckers continue losing revenue each day the strike goes on.

So far, consumer confidence has remained relatively steady. This attitude won't continue with so many soft spots developing in the economy.

Interested Watchers—Other labor settlements are closely tied to the steel industry's problems. Aluminum producers, for example, are still operating but under contracts extending 30 days beyond the steel settlement. But any benefits to aluminum workers are retroactive to the original expiration date—July 31.

The prolonged strike also means mounting tax losses to Federal, state and local governments. It is effectively destroying hopes of balancing the Federal budget this year.

Ways to Fight Unemployment

▪ Labor idleness has increased because of the steel strike. Such unemployment is usually temporary. But study on how to solve permanent unemployment problems continues.

Right now a congressional committee—the Senate Special Committee on Unemployment Problems—is looking into the question. As expected, opinion is divided on whether it's sound to revive depressed employment areas with Federal aid. And there's debate on whether jobs create profits, or profits create jobs.

Rewards for Help?—The U. S. should urge small businesses to relocate or expand in depressed areas, according to A. M. Woodruff, Dean of the George Washington University School of Government. Industries which do should get more liberal tax consideration, preferred treatment in landing government contracts, special loan assistance, and grants to cover the cost of relocating.

Frustrating Expansion—But George G. Hagedorn, director of research for the National Assn. of Manufacturers, disagrees.

"Such an approach could frustrate the forces expanding our economy," he says. "The objective should not be preserving job opportunities in any particular industries, occupations, or areas."

Rejecting Federal programs to assist distressed areas as interfering with economic growth, he states, "Jobs are made by profit opportunities."

Inventories Dropped During August

Inventories declined $400 million in August—the first drop this year. But at the end of the month they remained (on a seasonally adjusted basis) at $89.4 billion, about $4 billion above August 1958.

The reduction this August was about equally divided between the stocks of manufacturers and retailers. Manufacturers' inventories dropped $2 billion. Retail stocks declined the same amount.

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Let a qualified, experienced Eimco sales-engineer show you specifications and demonstrate the rugged Eimco Special Steel Mill Loaders. For prompt, courteous attention and service, contact the Eimco branch office or dealer nearest you, or write The Eimco Corporation, P.O. Box 300, Salt Lake City 10, Utah, U.S.A.

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AN IRON AGE SPECIAL REPORT TO MANAGEMENT

How to Prepare For Future Company Growth

By **Morehead Patterson,** Chairman, American Machine & Foundry Co., New York.

There is no pat formula or set of factors to follow in planning company growth and expansion.

But here are some general rules, based on experience, that can help in planning diversification or company growth.

▪ Since no one yet has come up with an accurate crystal ball, planning a company's future is still management's biggest gamble.

Much can be done to reduce the chances for error. But in the last analysis it's the judgment of individuals which determines whether a company will prosper and grow or wither on the vine and disappear.

Today we hear of any number of formulas for running a business. A figure like two per cent of sales, for example, is sometimes quoted as the amount to set aside for research and development. Yet when a company is founded, it risks all of its capital resources.

No Set Rules — Who can tell? Depending on the need, a company might have to put ten or even 50 pct of its profits into research to insure its future. How much to spend, and where, depends on management's judgement of the competitive picture.

There's no question that planning for future growth becomes more difficult every day: The pattern of world markets is changing in size, location and nature; technical breakthroughs are taking place at speeds which telescope development periods of a generation ago; still to be tapped fully are the vast markets created by the trend to more leisure time.

Let's consider for the moment what would happen if man no longer had the need for sleep. He would have from six to eight more hours a day to consume some things, wear out others, and find still others to occupy his new-found time. What market opportunities!

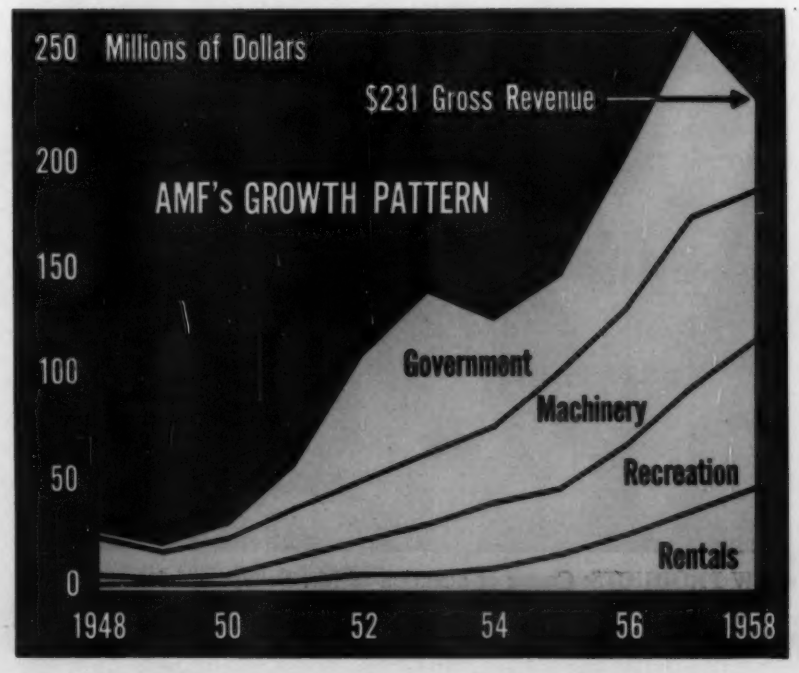
More to Come—This is exactly what's been happening as the working day in this country dropped from fourteen to eight hours. We still haven't caught up with the market potentialities of the leisure-time revolution — and it is still going on.

Faced with such wide-ranging possibilities, what are the questions management should ask itself in planning for future company growth? As I see it, there are three major areas of inquiry. These are:

1. Is the present business tied in with the future needs of the markets its serves?
2. Will the company have enough cash resources (profits and depreciation) to meet future requirements for staying in business?
3. For what growth opportunities is the company particularly well-suited?

Imagination Pays Off—The an-

Diversification Pays Off



swers to these questions call for more than gathering statistics and projecting them. If they didn't, fewer businesses would fail. Of course, this doesn't mean industry statistics and market data should be ignored. However, it's still the imagination and ability to see a need that really counts.

There is no limit to the payoff from a good, sound idea. Our company, for example, spent a great deal of time and money developing the Automatic Pinspotter of which over 63,000 are installed or on order throughout the world. Once the technical problems were licked, we were sure we had a product which would go over.

The advantages to bowling lane operators and bowlers themselves were obvious. Not only that but the population was booming and people had more time than ever before to engage in recreational activities.

But who could foresee the enthusiastic reaction of the housewife when pinspotters brought wholesome, pleasant atmosphere to the bowling center?

Basic Principles Apply — What I'm trying to get across here is that planning for future growth is not a mechanistic process. The same basic principles apply to large companies and small, a product or a product line.

The best place to start planning for the future is with present business units. Is what you already have consistent with your views on what you should have in the future? If so, how can you capture a larger share of these markets? If not, what are you going to do about it?

Answers to these questions can be obtained only by intensive study of all areas of the business once a year. From such a thorough investigation, any number of problems calling for immediate action may crop up.

Need Redesign—It may be that a product or product line is becoming obsolete. Depending on how far it has slipped, management may decide to invest in a redesign or drop the line entirely.

An increasingly common problem today is the product which has lost its price advantage to foreign competition. While the design may still be up to date, the only way out may be to manufacture it overseas.

It's also possible for a product to be priced right, have a good design and yet face a declining domestic market. However, a growing demand from abroad may call for revision of present selling and distribution methods to cash in on this new market area.

Watch Cash Flow—In studying business units, it's particularly important to gain some idea of the cash resources they are capable of providing in the years ahead. By knowing how much money it will have to work with, a company is in a much better position to plan future business strategy. At least it knows what it will be up against.

It's entirely possible that a product now showing a good profit is headed for a nosedive from which it can't pull out.

An example presents itself in the company serving an active, growing market with a full, profitable product line. But other more powerful companies are investing heavily in the field and can eventually dominate it. Aside from the robust overall market potential, the company in question can't count on a sustained high flow of cash from this source.

So, in forward planning a company must not only take into account the needs of future markets but also the resources it must have to compete for them.

New Growth Areas—Of course, a company would be remiss if it did not look at new opportunities for furthering its future growth. These may lie in new product development, the acquisition of a smaller company or a line of products. In the last ten years AMF has diversified in all three ways.

Regardless of the method, growth possibilities should be judged on how well they fit present skills and future needs.

It may be that a company wants to broaden its product line to fortify

NEW PRODUCTS: Center of attention of Mr. Patterson, left, and Hamilton Herman, AMF vice president and director of Research and Development Div., is "AMfab," a new glass cloth-reinforced plastic filter media.

Fit Research to Future Markets

▪ **From four plants in 1948, Board Chairman Morehead Patterson has lead American Machine & Foundry Company through an expansion program that now includes 39 manufacturing plants and twelve engineering laboratories.**

It all started when the company needed a broader earnings base to finance the costly development of Automatic Pinspotters for bowling centers. A well-known maker of special machinery for the tobacco and baking industries, the company moved swiftly into the recreation, defense, atomic energy and general industrial fields.

In ten years the annual volume of sales and machinery rentals rose some eleven hundred percent.

AMF considers research and development the heart of its future successes. Last year it spent $6 million for research, engineering and development—expects to put in another $9 million this year.

While the pace has been fast, it's also been carefully controlled. Mr. Patterson guides this broad diversification program with a few basic rules: Capitalize on the skills the company is best suited for; tie-in present operations with future market needs; look for opportunities 5, 10, or even 20 years ahead.

This thoughtful, long-range viewpoint not only governs Mr. Patterson's business thinking but also the many special services he performs for the federal government. As U. S.

representative for International Atomic Energy Agency, he negotiated research-reactor bilateral agreements with 28 countries under President Eisenhower's "Atoms for Peace" program.

He is a former vice president of the Economic Club of New York and a senior director of the National Industrial Conference Board.

one of its present markets. Or perhaps it desires the managment or technical talent of a smaller company to get a sound start in a new field.

Lead From Strength—American Machine & Foundry Company started out making automatic machinery for the tobacco industry. This equipment revolutionized tedious, time-consuming hand methods for making cigars and cigarets.

Later, it developed pretzel-tying and bread wrapping machines for the baking industry, then went on to turn bowling into a family sport with its automatic pinspotter. Today it is heavily engaged in developing launching systems for rockets and missiles.

The point here is that each of these developments hinged on a skill for which the company is particularly well qualified—the design of mechanisms to replace complex hand operations. Very great opportunities still exist in this area.

In our diversification program we were also attracted by the potential offered by the "do it yourself" and recreation markets. We entered these fields, as well as the atomic energy, missile and general industrial markets, with a view to strengthening our cash resources and for the fine future they promise.

Where Judgment Counts—It's in looking for growth opportunities that imagination and experienced judgment come heavily into play. For established markets, sales and profit are quite helpful. But it's almost impossible to forecast a market based on a completely new idea.

For example, there is considerable talk about taking the salt out of sea water to supply the country's growing coastal communities with a new source of fresh water.

This would be a totally new commercial development. It would be tied into questions of changing water demand and technology. Obviously, it's difficult to forecast the market growth and profitability in this area with reasonable accuracy.

Watch Timing — Judgment also counts strongly in estimating the time and money needed to make a new project pay off. It may take longer, cost more or require a technological breakthrough before it is ready for market. And while this goes on, there's the gnawing fear that the timing for the new product may be off—or that some one else may beat you to it.

Corporate planning and research are two of the most overworked terms in business today. Often they are used to imply that a company can get the answers to its growth problems by intensive organization and spending great sums of money.

There's no question of their value in providing a sound basis for discussion and understanding. But when all's said and done, it's the ability of management people themselves to see a need — and then provide the resources to meet it — that really counts.

Reprints of this article are available as long as the supply lasts. Write Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

welded with M&T Murex electrodes

Guarding the nation's most treasured documents is a job entrusted to what is probably the world's safest safe. Nightly, or in emergencies, cases containing the Declaration of Independence, Constitution and Bill of Rights are automatically lowered into the safe which protects the documents behind mammoth self-locking doors. In its construction, the Mosler Safe Company depended on M&T Murex electrodes.

This is one of a whole host of vital jobs being done with Murex electrodes. Other examples: Behlen Frameless Metal Buildings, which have survived what is probably the world's toughest single test – a nuclear blast – rely heavily on welds with Murex electrodes in commercial, school and farm building construction. And for the world's best cars – those produced in the U.S. – more than one out of four is joined or unitized with reliable Murex welds.

So it goes. Where there is dependence on the integrity of welds, there is dependence on M&T Murex electrodes . . . and welding machines, too.

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Detroit to Put Traffic on TV

U.S. Will Sponsor Traffic Control Program

Detroit, home of the products that cause traffic snarls, is trying to untangle this knotty problem.

Next summer it will start an around-the-clock TV spectacular. It hopes to headoff tie-ups before they form.—By A. E. Fleming.

▪ The time is 5 p.m. The place is an expressway in an American city. The late afternoon traffic rush is on. Cars are streaming from midtown business areas to suburban retreats.

Suddenly a car in the center of the expressway gets a flat tire. In a few minutes a chain of vehicles a mile long is linked behind the stalled car. And several hundred motorists clench their steering wheels and curse the day expressways were created.

Relief in Sight—This has happened to every city driver. Especially those who drive expressways in thickly-populated cities.

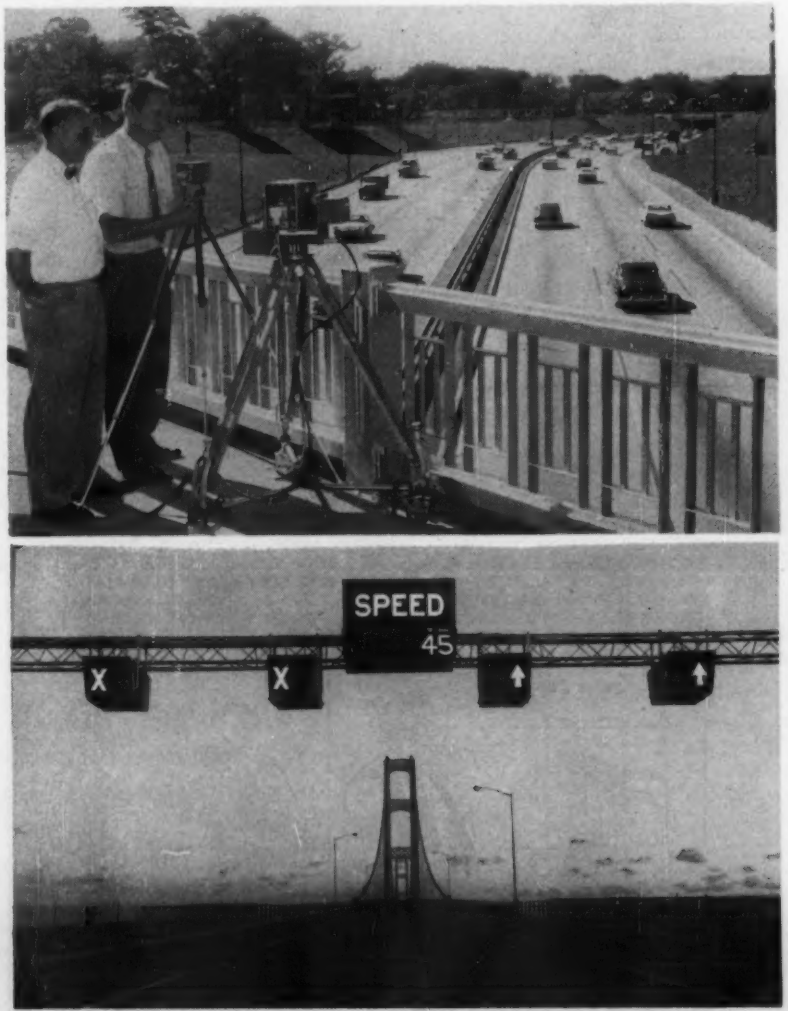
But relief may be in sight. An attempt will soon be made to solve the case of the late-for-supper expressway driver. Something may be done to help get him home in a hurry without a traffic worry.

TV Spectacular — The "something" involves television cameras and a pushbutton system of lane control signals.

The experiment will take place near downtown Detroit starting next summer. Fourteen television cameras will be stationed on expressway bridges. The bridges are about 1500 ft apart over a 3.2 mile stretch of road.

Studio One — Peering through weatherproof, heated and ventilated enclosures, the eyes of the 15 cameras will survey the passing vehicles 24 hrs a day. The cameras will be remotely controlled.

A control room in the house will contain 14 television monitoring screens, equipment for running a pushbutton system of lane and speed control signals on the expressway and a person to watch



TV FOR MOTORISTS: (Top photo) E. F. Gervais (left), Michigan State Highway Dept., and L. L. Goodell, Audio Equipment Co., Detroit, test television cameras overlooking Detroit's Lodge Expressway. A signal system (lower photo) such as one shown here on Michigan's Mackinac bridge will be tested on Detroit's expressways next summer.

the screens and activate the signals.

A Video First—When the tests start next year, it will mark the first time expressway traffic has been directed by a signal system. It also will inaugurate the first extensive use of television in traffic control.

"We hope the project will show us many things about expressway traffic," says E. F. Gervais, traffic research engineer for the Michigan State Highway Dept. "There's a lot to learn about the characteristics of expressway traffic and expressway drivers."

Twenty Questions?—Some of the questions expected to be answered: How do expressway drivers act under unusual conditions such as accidents and floods?

What causes major traffic delays and congestions and how can they be remedied?; How effective are lane control signals on expressways?; Is there a place for television in traffic monitoring?

On Camera—Here is an example of how the TV-signal scheme might work in a vehicle breakdown situation:

The car stops in the center lane of a three-lane expressway. A camera records the scene and relays it to the control room monitor. The person in the control room spots the trouble. He turns on the lone control signals in the area just ahead of the stalled car. This directs traffic to the two outside lanes.

Control operator then flashes on a "Ramp Closed" sign at the expressway entrance leading to the trouble spot. He activates an electric signal. This directs part of the oncoming traffic from the expressway to an exit ramp before it reaches the trouble spot.

Brainstorming — Because of the signal system, the number of vehicles in the trouble spot is reduced. And the traffic flows smoothly along the two outside lanes past the stalled car.

The idea for researching expressway traffic via television originated in Detroit last April. City officials suggested the project to the Michigan State Highway Dept. The Highway Dept. in turn made a proposal to the Federal Bureau of Public Roads.

Sponsored by U. S.—Approval was granted June 1. Since that time, research on the program has been carried out. This includes deciding on how much and what type of equipment to use.

The program will be carried out for two years. It will cost about $400,000, including equipment. Most of the money will be furnished by the Bureau of Public Roads. The City of Detroit and Wayne County will share the cost, however.

No Booby-Traps—"There is absolutely no law enforcement activity attached to the program," according to Mr. Gervais. "No police cars lurking for unsuspecting speeders. None of that speed trap type of thing.

"We are simply trying to uncover ways to aid the driver. To direct him safely and quickly past expressway obstructions. To help him in emergency situations. To find out how and why he behaves as he does in given situations. To help find out how we can improve expressway motoring."

Long Run Predicted—Although the length of the research program is set for two years, it could go longer. An extension depends on whether results are sufficient to warrant the outlay of more funds.

"Barring unforeseen hindrances," says Mr. Gervais, "I expect the project will be continued more than two years."

More Trucks Due

An annual new truck market of 1.5 million units a year will be normal within the next 10 years, predicts T. J. O'Neil, a member of Ford Motor Co's dealer policy board.

Best year to date was 1950 when 1,142,307 trucks were sold. The total will top one million this year.

The Bull of the Woods

"HIS MANNER IS AT ONCE DEFIANT, COLD AND FORBIDDING--HIS VOCABULARY GOES LITTLE BEYOND THE WORD NO, WITH THE ABRUPT FINALITY OF A BARK--HE GETS ABOUT WITH THE SHUFFLING GAIT OF A BADGER"... THEM BLASTED WRITERS! WHY, I TREATED THAT FELLER LIKE A KING!... TAKE THIS LETTER--
THAT WRITER MUST HAVE SEEN THROUGH THE ACT TH' BULL PUT ON, BECAUSE THAT'S HIM TO A "T"--BUT HOW COULD A WRITER GET HIM DOWN THAT GOOD?
I THINK HE PAID A GUY TO COME IN AN' ASK FER A RAISE--A GOOD WRITER NEVER WRITES WHAT HE SEES OR WHAT YOU SAY--AND HE'S GENERALLY RIGHT!
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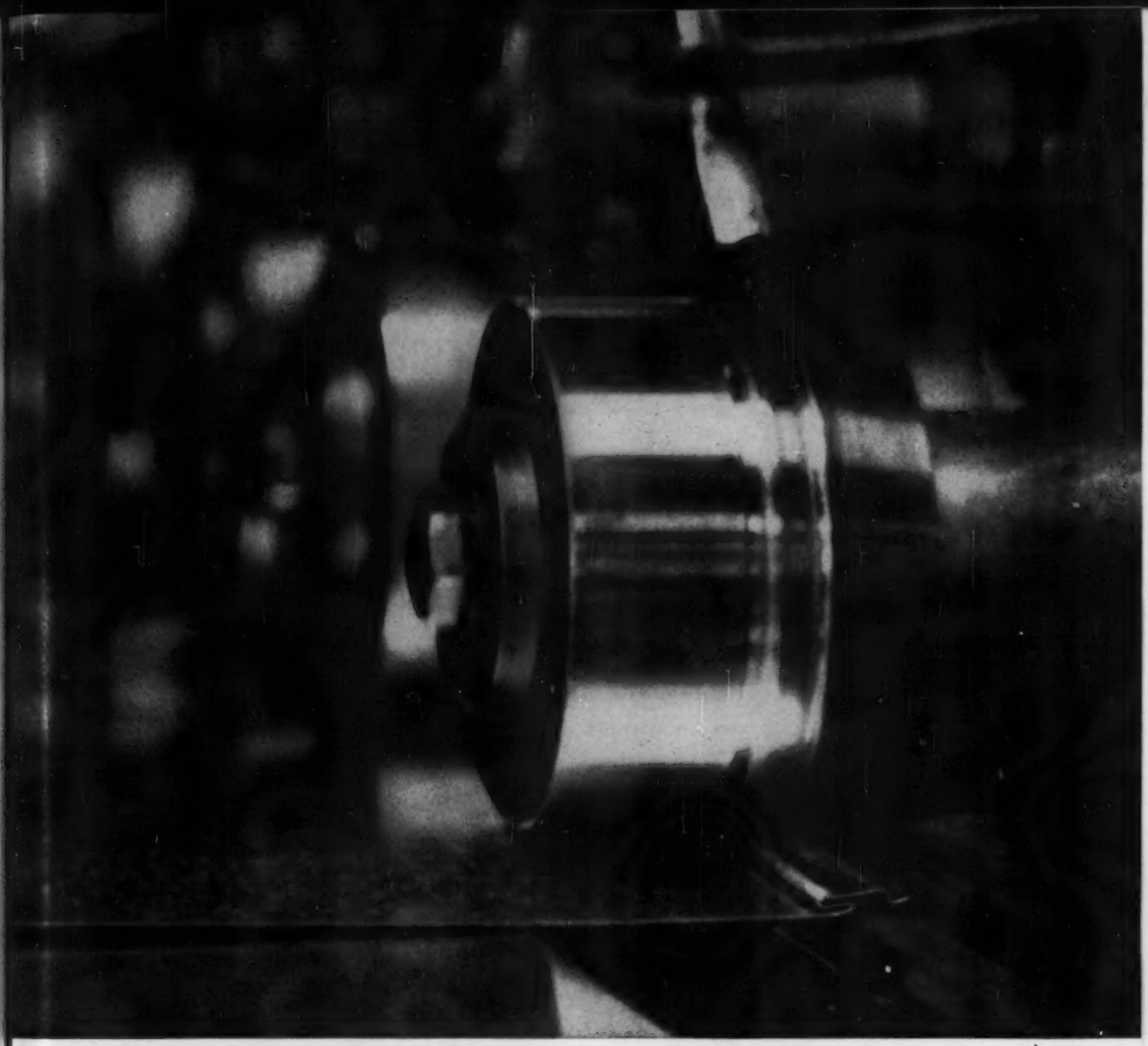

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New TUMBLEX "RP" (Round Pin) abrasive, 3/16" diameter x 5/8" length, is exactly the right size and shape to reach all areas of cylindrical serrated missile part with center hole.

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Send samples of parts you finish — large or small, simple or intricate — to our Sample Processing Department. We'll barrel-finish with the new "RP" or "TP" abrasive, or with any more suitable TUMBLEX type and tell you the abrasives, methods and equipment you need most. NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors around the world.

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Compulsory Mediation Proposed

Industry Stands to Lose if It Becomes Law

Sen. Wiley wants labor disputes in basic industries subject to mandatory Federal mediation.

Past history shows that Federal intervention tended to favor labor.—By G. H. Baker.

▪ A new law, requiring government mediation of future steel wage disputes, may be in the offing. At least one senator (Alexander Wiley, R., Wis.) believes mandatory Federal intervention should be the rule in wage disputes or strikes involving basic industries.

"Congress, when it reconvenes in January, may—and I believe it should—take a new look at the machinery for settling such strikes," Sen. Wiley declares. (See Special Report, P. 61)

More to Lose—Steel and other industries would undoubtedly lose much more than they'd gain by such a law. The history of Federal mediation and Federal arbitration shows that wage settlements managed or even suggested by Washington tend to give the unions closer to what they want.

Employers, under Federal intervention, almost invariably take a beating.

The Wiley proposal answers closely the demands of labor executives for mandatory factfinding boards that have authority to recommend the terms of strike settlements.

Past History—Before the Eisenhower Administration took office, the Federal government often intervened in wage disputes and pressured for settlement at or close to the union demands. Up to now, President Eisenhower has assumed a hands-off attitude toward labor-management negotiations.

But under Presidents Roosevelt and Truman, Washington made frequent use of factfinding boards in settling wage disputes. The usual composition of these boards was one labor member, one industry member, and one public member. The "public" member was usually someone sympathetic in some degree with the union point of view, with the result that the recommendations of these boards were always welcomed by the unions.

Take the Easy Way—It's an easy game to recommend higher wages that someone else has to pay. The so-called "public" members of the factfinding boards in the Roosevelt and Truman Administrations were always hailed as "statesmen" by union heads as well as by the rank and file. But these members had zero responsibility for paying the higher wages and benefits they recommended.

Under the Taft-Hartley law, factfinding boards are not authorized to make recommendations for strike settlements.

But this may be changed by the Congress next year, if Senator Wiley and some other members of the Senate and House have their way. Mr. Wiley bluntly suggests that steel management and the steel union "read the handwriting on the Congressional walls."

"More effective tools should be provided to handle such (strike) situations—not only in the interests of our domestic economy but also of defense," Mr. Wiley declares.

Unions Pick Political Favorites

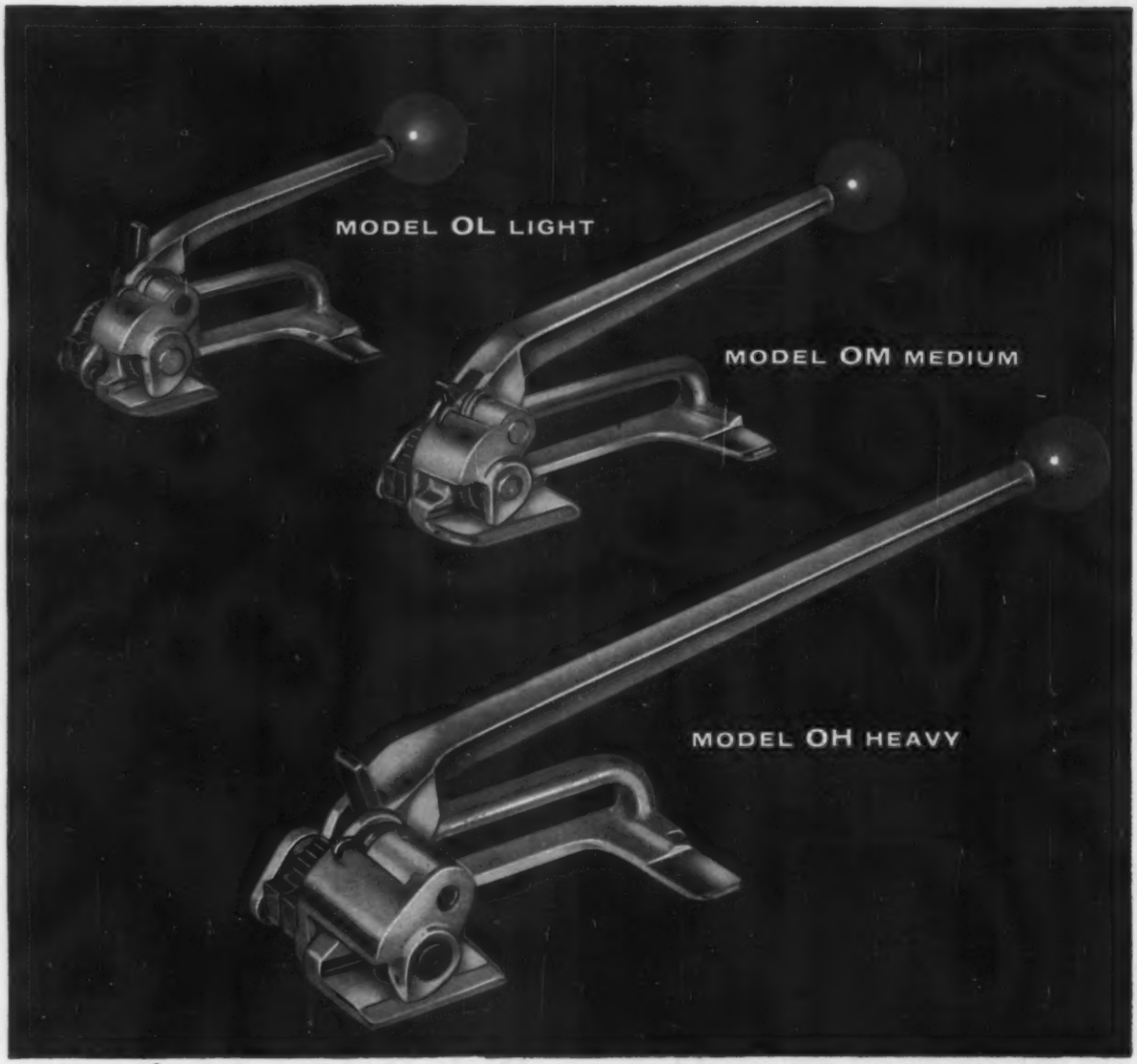
Unions have kicked off what promises to be a vigorous political campaign to elect their friends and punish their enemies at the nation's polling places in November, 1960.

Campaigns Started — COPE (Committee on Political Education), the political arm of the AFL-CIO, says it considers the election campaigns as "already underway." And it warns that it may be choosy in 1960 about the candidates it picks to support.

(Because many COPE-backed congressmen voted for the labor reform bill this year in defiance of AFL-CIO wishes, union heads believe they'll be more selective in the future as to which candidates will receive union dollars.)

Word of Warning—"Politicians might well give heed to the fact that trade union support should never be taken for granted," COPE states.

To show that it means business, COPE is urging local union officers to buy ($35) a 19-minute film on how to get maximum use out of the telephone in "getting out the vote" for union-backed candidates. It shows how "telephone teams" can "operate in furthering unions' political activity."



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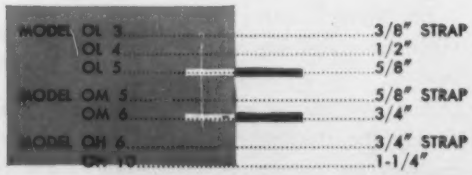

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West Expects Busy 4th Quarter

Business Should Equal or Top Last Quarter

Gains of 10 pct or more are predicted by some business leaders polled in the Farwest.

Southern California - Arizona-Nevada area is most optimistic section.—By R. R. Kay.

▪ Fourth quarter business activity on the West Coast will hum along to new record highs.

That's the prediction of 1000 Farwestern business leaders polled by the Prudential Insurance Co.

Equal or Better—Some 80 pct look for last quarter business to be as good as third quarter, or even better. About one-third of the executives see gains up to 10 pct. And another third expect more.

How will fourth quarter business this year stack up with the same quarter in 1958? As good as or better, say 85 pct of the panel members.

But optimism is off a bit—about 5 pct since Prudential's third-quarter poll.

Why Optimism?—The most optimistic region is southern California-Arizona-Nevada.

Construction keeps booming along throughout the Farwest. But it's expected to taper off and not make as good a showing as in fourth quarter 1958. Business leaders in the agricultural - extractive industries also see a drop coming.

Christmas business should be big. A better holiday quarter than last year's is expected by 90 pct of the retailers and wholesalers polled.

Optimism aside, how did the 11 Western states actually do this year? The Prudential's index of business activity for the second quarter made a new high—3.4 points above the first quarter. And that was 14.6 points above last year's second quarter.

Power for Aluminum

High freight costs are cutting into the Pacific Northwest's long-time advantages of low-cost power for aluminum production.

Dewayne Kreager, Washington State's Director of Commerce and Economic Development, says the Pacific Northwest has a capacity of 689,000 tons. However, the region turned out only 441,000 tons last year.

He says Eastern aluminum producers have a real edge. They're closer to the major makers of aluminum products.

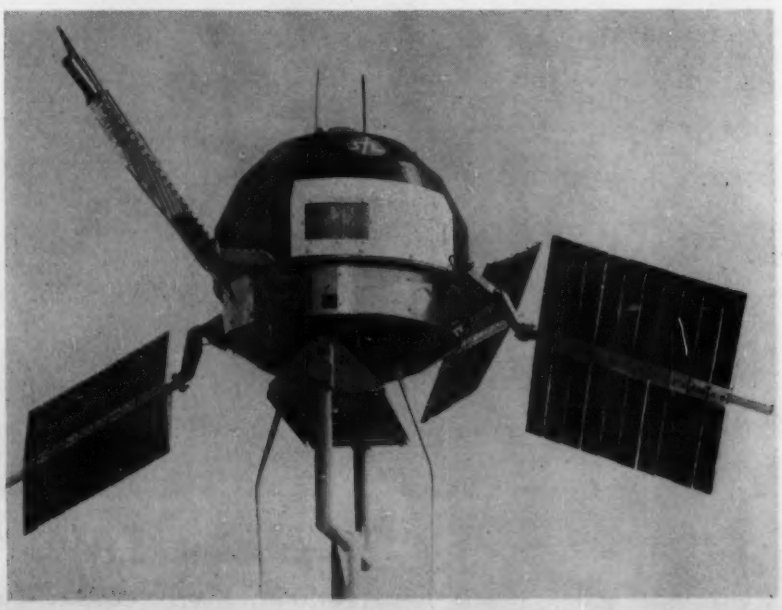
Boost for Coal Mines?

Washington State's dormant coal mining industry may be in for a revival.

Gov. Albert D. Rosellini says the state's coal deposits are the "largest and most varied of any state or province on the Pacific Coast, with the possible exception of Alaska."

He points out the upsurge in demand for coal: (1) as a raw material in the chemical industry, and (2) as fuel for generating electric power.

Paddle Wheels Trap the Sun's Energy



SUNBEAMS TO RADIO WAVES: Aluminum paddles on Explorer VI satellite open 150 miles above the earth. They are filled with 8000 solar cells used to convert sunlight into energy powering radio system. Space "arms" were made by Fabricel Div. of Poly Industries, Inc., Pacoima, Calif.

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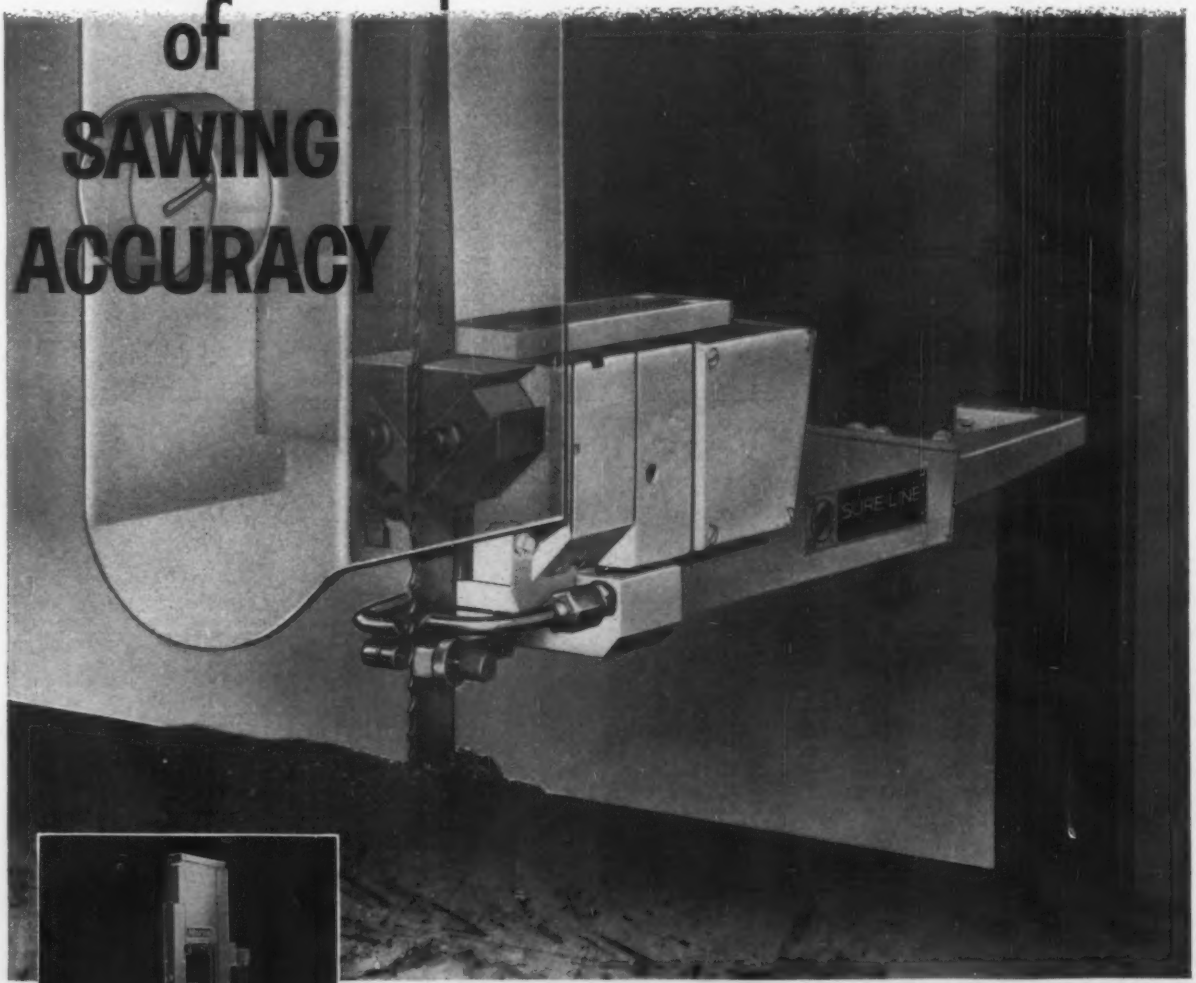
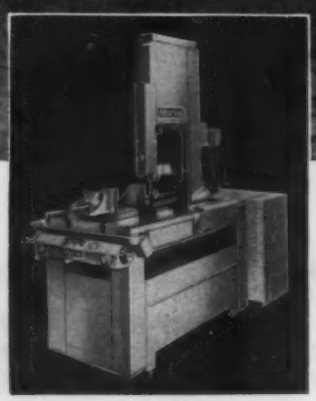
A new MARVEL invention—the "Sure-Line" Automatic Blade Controller—*at last* attacks the problem of maintaining accuracy in high speed band sawing.

This simple, but effective electro-mechanical guidance system invented and developed by MARVEL, actually "steers" a band blade while it is cutting, to maintain a straight path!

Designed as an integral part of, and available only in the new MARVEL 81 Series All Hydraulic Band Saws, the "Sure-Line" guidance system continuously senses and automatically corrects any tendency of a band blade to cut inaccurately. Now—with the MARVEL "Sure-Line" guidance system, every square inch of cutting life is squeezed out of each blade. The result: longer blade life, and cutting costs lowered to a point that makes high speed production cutting-off with a band saw economically practical.

A demonstration of the new MARVEL No. 81 All Hydraulic Band Saw will prove it. Write today for the complete story, and ask about a demonstration.





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Cincinnati Tells Need for Progress

Occasion Is Company's 75th Anniversary

More than 3000 executives will attend Cincinnati Milling Machine's anniversary program.

Demonstrations show new techniques, display need for industrial progress. — By R. H. Eshelman.

▪ With the pace of machine tool sales still lagging, the nation's largest builder is seizing an opportunity to get across its point.

To meet the new challenge of higher American living standards industry must have new and better tools to make labor more productive.

Occasion is the 75th anniversary celebration of Cincinnati Milling Machine Co. In a period of several weeks, more than 3000 of the country's industrial leaders and manufacturing executives will be trooping through the firm's doors.

More Than Happy Birthday—But it will be far more than a birthday party. Instead, Frederick V. Geier, chairman of the board, and his executives have turned the full imaginative power of the firm loose on the project. Result is a lively, day-long program utilizing modern high-power audio-visual techniques.

From the time guests don pith helmets, pick up passports and guides for a safari through the jungle of high production costs, until they witness unveiling of three top nominees at the cost-cutting convention they are both amused and entertained. But at the same time they pick up a remarkable fund of facts about advances in metal cutting and forming techniques.

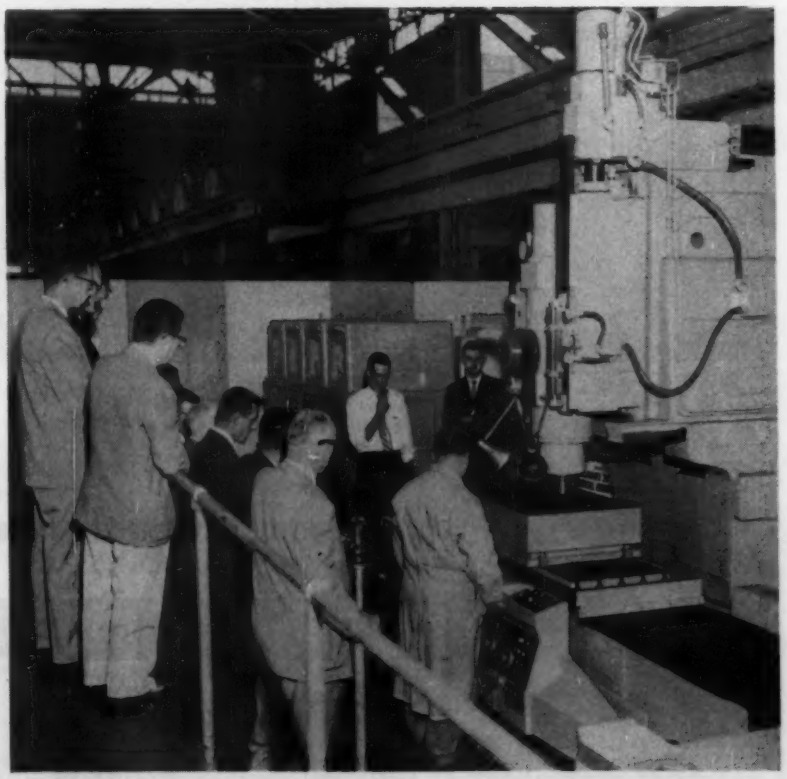
What to See—Over 87 demonstrations feature 20 new machines cutting typical workpieces. Then there's a peek at research. This look into the future reveals machining experiments at elevated temperatures; wear studies with radioisotopes; hydraulics and friction experiments, and others.

Electric trains wind through dramatic exhibits of progress in metalworking. Unique experience for guests is when they become "workpieces" in an "Index to Profit" merry-go-round.

Highlight "station" features a Telamatic control. This simplifies production milling machine programming to "putting round pegs in round holes." It allows operators 550 billion, trillion separate choices.

How to Beat Obsolescence—Techniques and terms of Cincinnati's numerical control system for licking dragging obsolescence in job lot machining: parabolic interpolation, cutting tool compensation, automatic repositioning and zero shift. Demonstrations feature the largest collection of different types of N-C machines ever assembled.

Cincinnati Shows Machines in Action

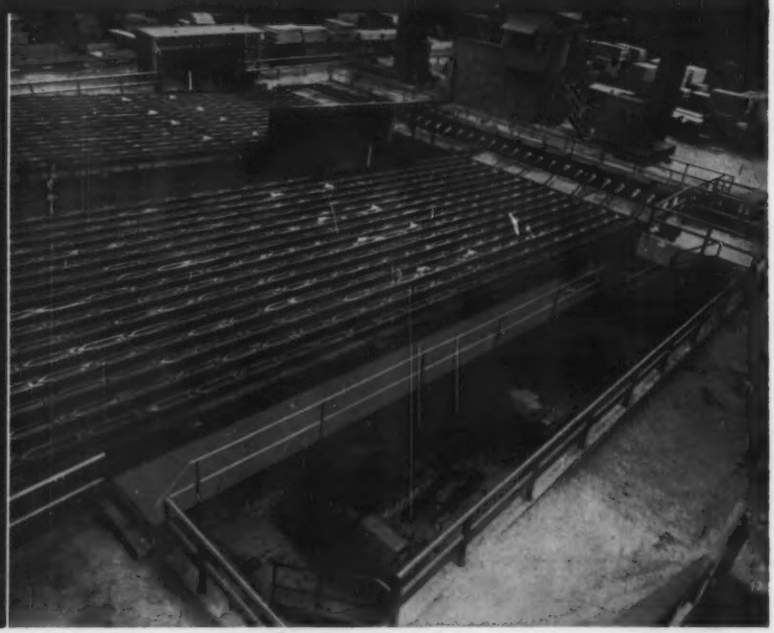


HAPPY ANNIVERSARY: Guests at Cincinnati Milling Machine Co.'s 75th anniversary show watch a numerically controlled milling machine.

TREADWELL COOLING BED

built in tandem, each over 100 ft. long. Each bed will cool 125 tons of 4" x 4" steel per hour.

For heavy duty and efficient production, this steel company called on Treadwell Engineers. The result are these Treadwell Cooling Beds efficiently operating day in and day out. If you have a machinery problem, call on Treadwell Engineers.



Pictured above: Treadwell Cooling Beds at work in an eastern steel mill.

TREADWELL

SALES AND ENGINEERING OFFICES:

208 S. LA SALLE STREET
CHICAGO 4, ILL.
CEntral 6-9784

1015 FARMERS BANK BLDG.
PITTSBURGH 22, PA.
ATlantic 1-2883

Manipulators, Mill, etc.
Mills, Billet, Merchant & Bar
Mills, Rod
Special Machinery
Coilers & Reels

Conveyors, Coil
Drives & Pinions
Ejectors, Furnace
Gauges, Shear, Saw, etc.
Beds, Cooling,

Mills, Vertical Edging
Tables, Mill
Tables, Tilting & Lift
Tables, Transfer
Transfers

Beds, Inspection
Bumpers, Furnace
Pushers, Furnace
Repeaters
Handling Equipment (Kick-offs, Pilers, Cradles, etc.)

CASTINGS—Electric Furnace Steel, Ductile Iron, Gray Iron and Ni-Hard

Big Blast—A new blast furnace is being built at Granite City Steel Co. With a hearth diameter of 28 ft, it will be able to produce 1800 tons of pig iron a day. When completed, July 1, 1960, Granite City Steel will be able to produce 3000 tons of pig iron a day, or 1.1 million tons a year.

Convert to Carbide—Union Carbide Metals Co. plans to produce calcium carbide at its Sheffield, Ala., plant. An existing submerged-arc electric smelting furnace will be converted for calcium carbide production. Remodeling work is expected to be completed and production started by mid-1960.

Rolling Along—Kaiser Aluminum & Chemical Corp.'s new 2-Hi bright strip mill is in operation at Ravenswood, W. Va. It will produce highly polished aluminum coil in widths up to 36-in. and in gauges one-sixteenth of an inch or less. It is used in the decorative trim field.

GE Turns AC to DC for OM—General Electric Co. has a $1 million order to build a huge silicon rectifier for Olin Mathieson Chemical Corp.'s Niagara Falls, N. Y., plant. Olin Mathieson will use the system to convert 60-cycle electric power into direct current for the operation of chlorine-caustic cells.

Win Casting Contest—J. T. Eccles and D. H. Davis, Rockford Machine Tool Co., won first prize in the 1959 Annual Design Contest sponsored by the Gray Iron Founders' Society. Winning entry was conversion of a prototype machine tool casting originally designed of welded steel.

Business Under the Palms—Earle M. Jorgenson Co. will open a complete service center in Honolulu early in 1960. It will offer all types of steel and aluminum to the Hawaiian industry. Ziegler Steel Service Corp. is opening a steel, aluminum, copper and building products warehouse in Honolulu.

On the Surface—Peninsular Steel Co., Detroit, has constructed a new building addition to be used exclusively for surface grinding. Latest and modern machines have been installed, making it possible for them to surface grind to .01 in.

Dear President—The Alloy Casting Institute has elected to the office of president, J. B. Dear, sales manager, The Duraloy Co., Scottdale, Pa. Elected vice president, was J. S. Wooters, vice president, General Alloys Co., Boston.

Interstate Expands — Interstate Steel Co. is building a $1.1 million warehouse and office in Des Plaines, Ill. The new plant, on an 11.5 acre site, will have a total area of 83,000 sq ft. Completion is expected by May, 1960.

Going to Town — The Yale & Towne Mfg. Co. is building an addition to its Trojan Div. plant at Batavia, N. Y. When completed early in 1960, it will permit an increase in production of Yale & Towne's Trojan line of pneumatic-tire tractor shovels.

INDUSTRIAL BRIEFS

New Films From Reynolds—Reynolds Metals Co.'s new plastic plant, Grottoes, Va., is in full production of plastic films. They are making a full line of polyvinyl chloride and polyvinyl alcohol films under the Reynolds plastics trade name, "Reynolon."

Wheelabrator Gets Lake Erie—Wheelabrator Corp., Mishawaka, Ind., has acquired Lake Erie Machine Corp., Buffalo, N. Y. Operating as a wholly-owned subsidiary, Lake Erie Machinery will continue to manufacture hydraulic and extrusion presses, die casting machines and equipment for the metal processing and printing industries.

Busy Building Beehives—Salem-Brosius, Inc., has a contract from Carpenterstown Coal & Coke Co., subsidiary of Sharon Steel Corp., for the design and construction of two batteries of 132 beehive coke ovens, a total of 264 ovens.

Acme Visible Cabinets give you inventory control at a glance

With an Acme Visible Control System on guard, there'll never be shortages in materials or equipment, or spare parts to interrupt the smooth flow of production. Inventory facts are at your fingertips. Visible signals flag your eye whenever an item needs reordering. For full facts on how you can control inventory this easy, efficient way . . . mail the coupon.

ACME VISIBLE

Acme Visible Records, Inc., 3816 W. Allview Dr., Crozet, Va.

To learn how my company can cut costs, increase efficiency—send free folders on systems for: ( ) Inventory Control ( ) Production Control

NAME_____

POSITION_____

COMPANY_____

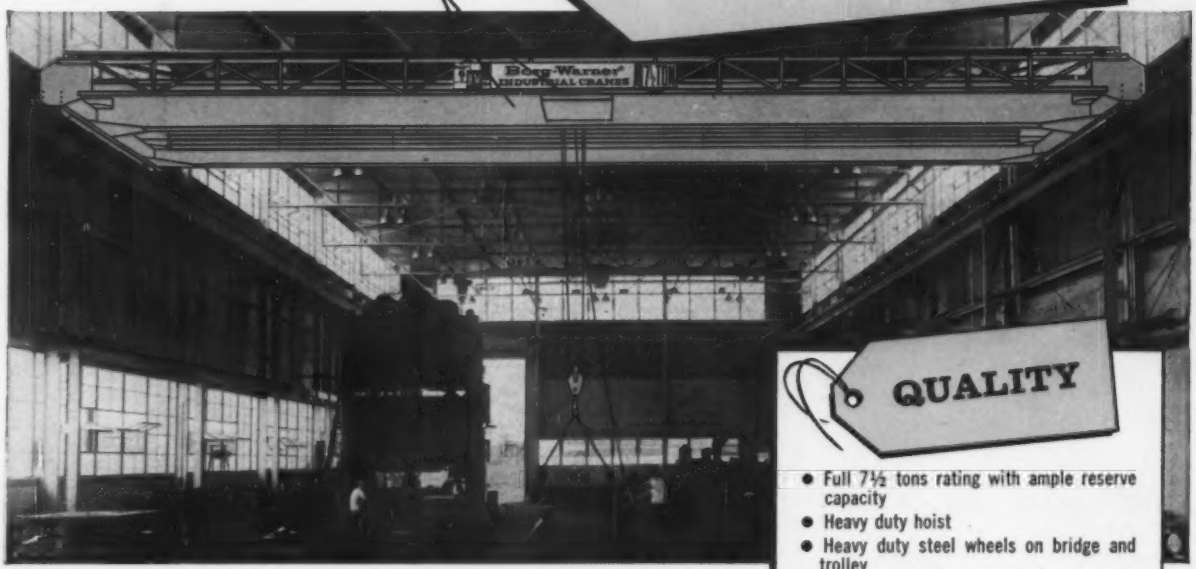
CITY_____ STATE_____

Borg-Warner Industrial Cranes

Quality at a price you can afford...

$9900.00

For a 7½-Ton, 60 Ft. Span, 3 Motor, Top-Running Double Girder Industrial Service Crane



QUALITY

- Full 7½ tons rating with ample reserve capacity
- Heavy duty hoist
- Heavy duty steel wheels on bridge and trolley
- All welded jig bored and jig assembled end trucks
- Long life precision ball and roller bearings
- Large gusset plates at end trucks
- Outrigger machinery girder construction
- Heavy duty gear reduction bridge drive
- Fluid coupled bridge and trolley drives
- Full magnetic push button control
- Magnetic bridge brake

MODERN DESIGN

The crane illustrated is a typical double girder installation. For shorter spans, smaller capacities and lighter or intermittent duty Borg-Warner Industrial Cranes can supply your needs at even lower prices.

Why Borg-Warner Industrial Cranes are BETTER VALUES

Value is determined by QUALITY *and* PRICE . . . and, a price like this for superior Borg-Warner Industrial Cranes construction and performance assures you of top value for your materials handling investment.

If you want to boost your production and operating profits by making full use of overhead space for materials handling . . . if you can use the extra storage space an overhead crane will provide as compared with fork-truck stacking . . . if you can benefit from aisles and work areas cleared of floor-type handling equipment . . . it will pay you to consider a Borg-Warner top-running, motor-driven crane like this. The cost may be far less than you had imagined. One crane owner thought it would cost him nearly four times this price to duplicate his crane.

Borg-Warner Industrial Cranes offers a complete line of overhead cranes . . . for light, medium or heavy service . . . constant or intermittent service at slow, medium or high speeds . . . operation from cab or floor. Get in touch with B-W Industrial Cranes today for answers to your materials handling problems.

Industrial CRANES — B-W — BORG WARNER

Design it better . . .
Make it better.

Find Your Nearest Distributor Under CRANES in The Yellow Pages

Distributors in all principal industrial cities.

Borg-Warner® INDUSTRIAL CRANES

1510 S. PAULINA STREET, CHICAGO 8, ILLINOIS

Export Sales: Borg-Warner International, 36 South Wabash Ave., Chicago 3, Illinois

W. I. Wilt, named vice president, advertising and sales promotion, The Sheffield Corp., Dayton, O., a subsidiary of Bendix Aviation Corp.

The Ferry Cap & Set Screw Co. —**H. D. North, Jr.,** elected president.

Rust Furnace Co.—**O. D. Rice,** elected president; **F. A. Blaine,** named general manager.

Hannifin Co., Div. of Parker-Hannifin Corp.—**O. J. Maha,** appointed president and general manager.

Metals Engineering Corp.—**J. A. Kelley,** named executive vice president and general manager, Greeneville, Tenn.

Altamil Corp.—**G. L. Canfield,** elected executive vice president, and **P. R. Cannon,** treasurer, El Segundo, Calif.

M. S. Kaplan Co.—**Sheldon Kaplan,** appointed vice president.

The Dole Valve Co.—**T. B. Chace,** appointed executive vice president.

L. W. Nash Co.—**R. R. Stuckey,** elected vice president and director.

Pullman Inc. — **T. A. Micali,** elected vice president and general counsel.

Borg - Warner Corp., Calumet Steel Div.—**R. E. Salisbury,** appointed manager, merchant bar sales.

Jones & Laughlin Steel Corp.—**W. J. Pohl, Jr.,** appointed administrative asst. to the director, Production Planning Programs.

The Youngstown Sheet & Tube Co.—**J. P. Tierney,** appointed superintendent, Rod, Wire and Conduit Depts., at Struthers; **Glyn Roberts,** named superintendent, Property Protection Dept.

Climax Molybdenum Co., Chemical Div.—**E. E. Smith,** appointed manager.

Braeburn Alloy Steel Corp.—**C. T. Fletcher,** appointed chief metallurgist.

Louis Polk, Jr., named asst. vice president and manager, gaging and automation systems, The Sheffield Corp., Dayton, O., subsidiary of Bendix Aviation Corp.

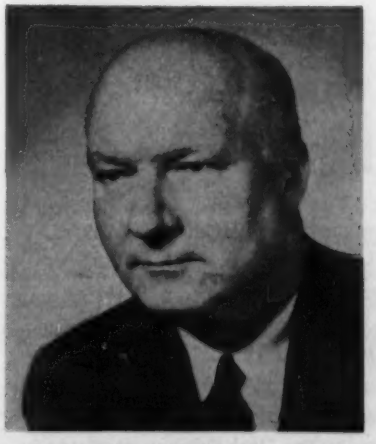
Sel-Rex Corp. — **Dr. D. G. Foulke,** named research director, Precious Metals Div.

National Metal Products Co.—**H. A. Beckert,** elected controller.

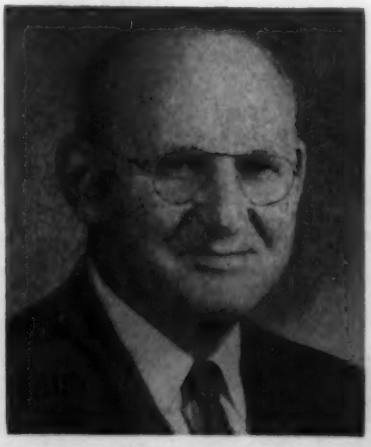
Air Products, Inc., Industrial Gas Div.—**J. K. Stewart,** appointed general sales manager, and **J. W. Blanton,** appointed Allegheny regional manager.

Westinghouse Electric Corp.,

(Continued on P. 92)

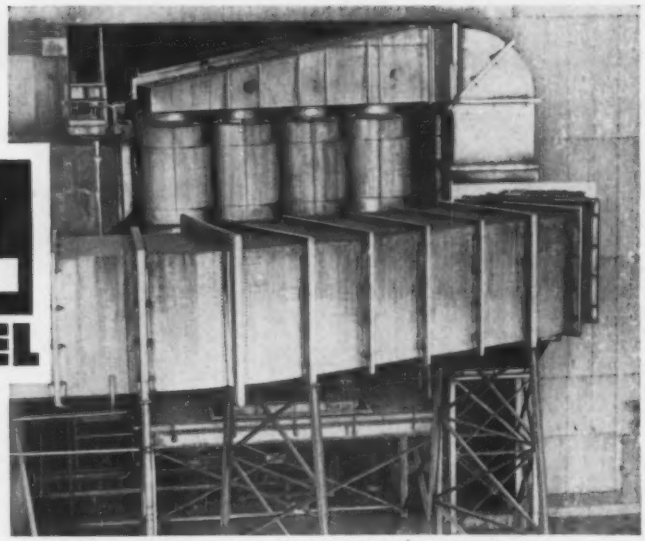


B. G. Tyrrell, elected executive vice president, The Hanson-Whitney Co., Hartford, Conn.



Weber deVore, named director, Advanced Materials Div., Taylor Fibre Co.

Ross Russell, named manager, industrial engineering, The Timken Roller Bearing Co.



Buell Cyclone System on gas duct exit of sintering machine at Jones & Laughlin, Cleveland.

BUELL High Efficiency Cyclones at Jones & Laughlin

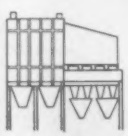
Specially designed for sintering machine operation, these Buell extra-efficient cyclone collectors handle 280,000 CFM of dust-laden gases from sinter bed before entering exhaust fan. Sixteen large-diameter cyclones at exhaust fan and four at the discharge end recover an important *extra percentage* of dust, beyond the abilities of ordinary cyclones, that contributes to the operating efficiency of the machine.

Only Buell Cyclones have the "Shave-off", which traps dust rising in the double eddy currents within the cyclone. This uniquely successful feature increases cyclone efficiency, permits large-diameter design which eliminates bridging, clogging, or plugging. Heavy plate construction and ¾" refractory lining provide long service life and minimum maintenance.

Decades of experience in the collection and recovery of industrial dusts back up Buell engineers. An analysis of your plant's dust collection problems may be made without cost or obligation. For a copy of the booklet, "The Exclusive Buell Cyclone", just write Dept. 42-J, Buell Engineering Company, Inc., 123 William Street, New York 38, N. Y.

BUELL CYCLONES

"SF" ELECTRIC PRECIPITATORS



PRECIPITATOR-CYCLONE COMBINATIONS

buell®

Experts at delivering Extra Efficiency in

DUST COLLECTION SYSTEMS

(Continued from P. 91)

Sturtevant Div.—**H. W. Rainey, Jr.,** appointed general sales manager.

Tarzan Monda, named division industrial engineer, Steel and Tube Div., The Timken Roller Bearing Co.

Sharon Steel Corp.—**Dr. Dillon Evers,** appointed to the Management Committee as consulting metallurgical engineer.

The Rolle Mfg Co., Inc.—**Carl Decina,** named plant superintendent.

P. R. Totten, appointed works manager, Cleveland Mill Div., Chase Brass & Copper Co

---

Aluminum Co. of America—**R. P. Black, Jr.,** appointed asst. manager, Atlanta, Ga., district sales office; **H. A. Faisst,** appointed manager, Philadelphia district sales office; **W. L. Dykhuizen,** appointed

(Continued on P. 94)

POSITIVE DUPLICATION – EVERY TIME!

Exact duplication of one person's fingerprints by another person is impossible. Discovery of this amazing fact in 1891 changed the science of detection and identification throughout the world.

CUT CLEANING COSTS

You'll be able to track down and arrest cleaning room costs . . . when you start using CINCINNATI (PD) WHEELS. That's because all (PD) * wheels (including the swing frame wheels shown above) are made by the remarkable CINCINNATI (PD) manufacturing process. Plus the fact that our trained and experienced grinding specialists are ready to assist you in quickly detecting the best grading for snagging operations.

KEEP COSTS CUT

When you have the CINCINNATI (PD) WHEEL that gives you the lowest labor and wheel cost, you then can be sure that every reorder wheel will act and grind exactly like the original wheel. The CINCINNATI (PD) manufacturing process gives you Positive Duplication . . . time after time after time. Once your cleaning costs are cut, they *stay* cut . . . with CINCINNATI WHEELS.

CALL CINCINNATI

For the help of a CINCINNATI grinding specialist in working down those cleaning room costs, call your CINCINNATI (PD) GRINDING WHEELS distributor, or contact Cincinnati Milling Products Division, Cincinnati 9, Ohio.

(PD) POSITIVE DUPLICATION

CINCINNATI®

GRINDING WHEELS

*Trade Mark Reg. U. S. Pat. Off.

A PRODUCTION-PROVED PRODUCT OF THE CINCINNATI MILLING MACHINE CO.

Add a Quality String to Your Bow...

WALLINGFORD

Stainless Strip and Tubing

If you are aiming at new design or performance targets for your stainless steel products – or parts – Wallingford can add an important quality string to your bow.

Every pound or inch of Wallingford Stainless Steel Strip and Tubing is of consistent, unmatched quality, because *Wallingford produces tonnage on a laboratory basis.* Exacting standards – unsurpassed in the industry – are maintained by utilizing the most advanced production control methods and facilities yet developed. Tensile tests, X-ray diffraction studies, automation gaging, laboratory samplings, and many other tests and techniques assure *super-quality.*

Are you presently getting this "quality insurance" when you purchase stainless steel? If not, contact The Wallingford Steel Co., Wallingford, Conn., for further data and a copy of our latest data book.

THE WALLINGFORD STEEL CO.

Progress in Metals for over 37 Years

WALLINGFORD, CONN., U.S.A.

COLD ROLLED STRIP: Super Metals, Stainless, Alloy
WELDED TUBES AND PIPE: Super Metals, Stainless, Alloy

(Continued from P. 92)

manager, Omaha, Neb., sales office; **C. B. Thompson,** appointed manager, Oakland branch sales office.

E. G. Messler, elected president and general manager, Sandvik Canadian Ltd.

Latrobe Steel Co.—**R. N. Kolb,** named labor relations manager, Latrobe, Pa.

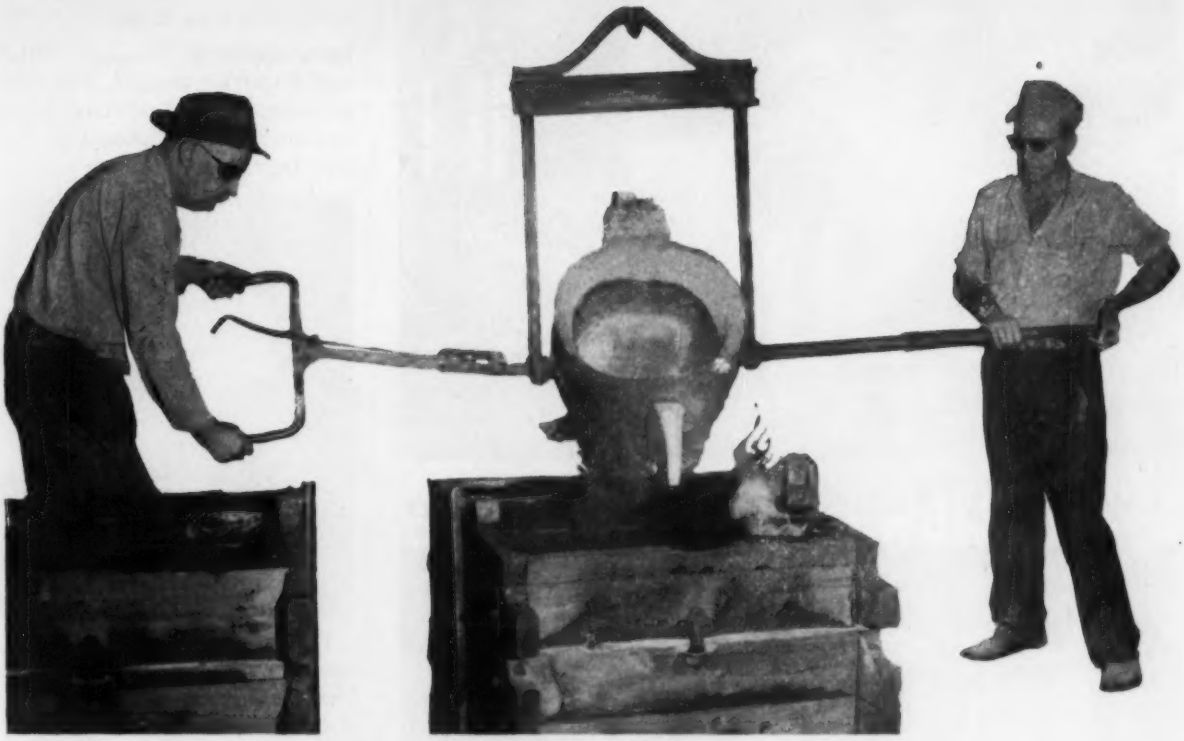
The Youngstown Sheet & Tube Co.—**W. J. Prochak,** appointed superintendent, Cold Drawn Bar Dept., Brier Hill plant.

R. T. Drennan, appointed director, sales, Kaiser Refractories & Chemical Div., Kaiser Aluminum & Chemical Sales, Inc.

The Ready-Power Co. — **W. R. Mattes,** appointed Philadelphia district manager.

General Electric Co.—**J. L. Man-**

(Continued on P. 96)



Fast Facts for Foundries

. . . seeking new Plant Sites

If you're considering a new foundry . . . or relocation of your present operation for greater efficiency . . . don't overlook these facts.

Within the six progressive states served by the Norfolk and Western, increasing industrialization offers new opportunities for foundries. Here, too, you are near huge quantities of superior Bituminous Coal, numerous coke ovens, ample limestone and water . . . as well as many manufacturers of foundry equipment and supplies.

Labor is home-rooted and dependable, with high productivity and low employee turnover. Via the dependable N&W you are near major markets in the East, South and Midwest. And communities in the Land of Plenty offer traditionally good living.

Give us your new plant requirements, in confidence, and let us see if we can meet them.

Land of Plenty

Phone, Wire or Write:

H. P. Cotton
Assistant Vice President—Industrial Development
Division IA-857 (Phone DIamond 4-1451, Ext. 474)
Norfolk and Western Railway
Roanoke, Virginia

Norfolk and Western RAILWAY

Two-way Sand-handling System

No "dead-heading" at Eastern Malleable

When your sand has to be moved long distances between preparation area and the points of use you can take a tip from The Eastern Malleable Iron Co.'s Wilmington, Del. foundry where these hauls are about 600 feet.

They solved this problem with the use of speedy, high-capacity "PAYLOADER" tractor-shovels and a set-up that practically eliminates all "dead-heading" or travel without payload. So the "PAYLOADER" units are able to scoop up sand from the pouring floor, carry it 600 feet to the shaker, re-load with prepared sand from the nearby pile for the return trip and deliver it to any of the 35 molding stations.

Eastern's newest "PAYLOADER" is this model H-25 — the last word in tractor-shovel design and productivity. It has a carry capacity of 2,500 lbs., it has power-steer, power-shift transmission with two speed ranges both forward and reverse, power-transfer differential and the fullest system of air and oil filters and grease seals for long-life protection and low maintenance.

Your "PAYLOADER" Distributor is ready to give you all the facts on the H-25 or any other "PAYLOADER" models that best fit your needs.

HOUGH

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

The FRANK G. HOUGH Co. 2-A-2
733 Sunnyside Ave.
Libertyville, Ill.

☐ Send me more data on Model H-25
☐ Other "PAYLOADER" units

Name
Title
Company
City
State

(Continued from P. 94)

agan, appointed manager, marketing research, product and sales planning, and **J. J. O'Hara,** named manager, industry sales, Gas Turbine Dept.

E. C. Tinsley, named director, marketing, Kaiser Refractories & Chemical Div., Kaiser Aluminum & Chemical Sales, Inc.

E. H. Holm, named manager, marketing research, Latrobe Steel Co., Latrobe, Pa.

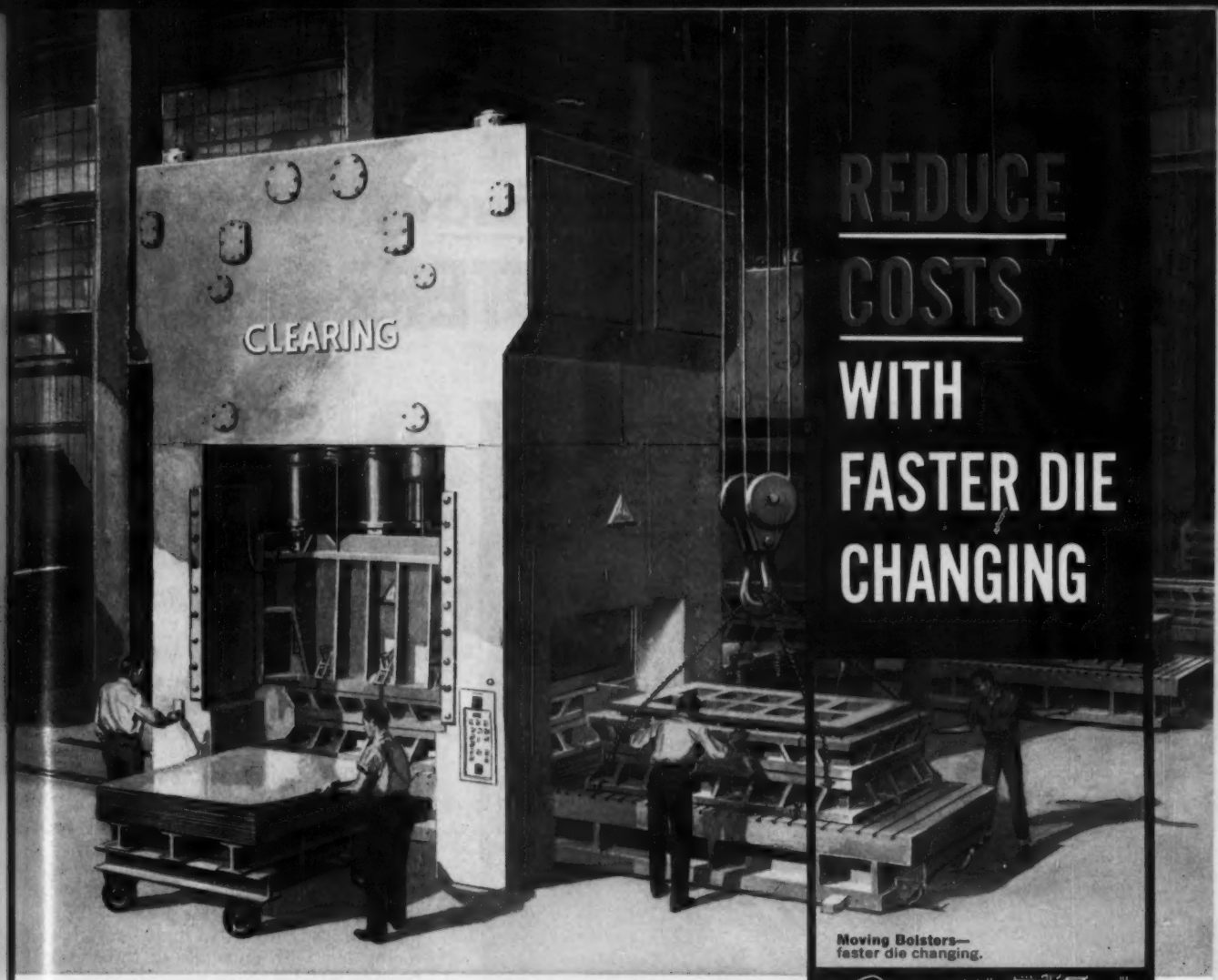
Transue & Williams Steel Forging Corp.—**R. E. Dahlin,** appointed sales representative.

Republic Steel Corp., Berger Div. —**R. L. Keiser,** appointed branch manager, Philadelphia.

OBITUARIES

C. G. Purnell, 66, director, market research, Jessop Steel Co., Washington, Pa.

W. E. Bannerman, 58, president and general manager, Page-Hersey Tubes, Ltd.



REDUCE COSTS WITH FASTER DIE CHANGING

Moving Bolsters—
faster die changing.

NOW CLEARING IS BUILDING THE MOST ADVANCED MOVING BOLSTER PRESS LINES EVER CONCEIVED

Clearing's Research and Development team has, for several years, pioneered concepts of press design to give press users undreamed of economies in manufacturing. Now, for the first time, these concepts are represented in features being built into several lines of presses in Clearing's plant.

These lines, similar to the illustration above, will reduce costs considerably because:

- MOVING BOLSTERS shrink die setting hours to minutes.
- AUTOMATIC SHUTHEIGHT CONTROL speeds adjustment and prevents costly and time-consuming damage to dies.
- 360° AUTOMATION LIMIT SWITCHES speed change-over from one production setup to another.
- HYDRAULIC OVERLOAD PROTECTION safeguards the press and dies thereby reducing down time.

Find out how the many cost-shattering features of this line can benefit YOU. Write for bulletins on Moving Bolster press lines.

Clearing division of U.S. Industries, Inc. manufactures Torc-Pac presses, hydraulic presses, Clearing-Axelson and Clearing-Harrison lathes, dies and special tooling, and special equipment for the aircraft and missile industry.

360° Limit Switch
speeds changeover time.

Automatic Shutheight Control
speeds adjustment, increases accuracy

Hydraulic Overload Protection
increases safety

USI Clearing

DIVISION OF U.S. INDUSTRIES, INC.
6499 W. 65th Street, Chicago 38, Illinois

Metallurgical Memo from General Electric

Two great cutting BETTER PROFITS

*Sizes 16V and 85V: adjustable range 1/16" to 7/32"
Size 20V: adjustable range 1/16" to 11/32"

1

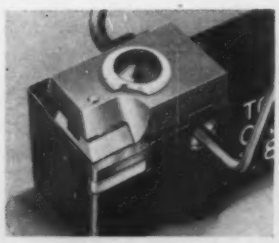
General Electric announces the only Adjust-O-Breaker toolholder

Carboloy® toolholder with adjustable chipbreaker lets you adjust from any angle . . . offers any desired adjustment within its range* . . . features "floating" indexable chipbreaker with absolute repeatability.

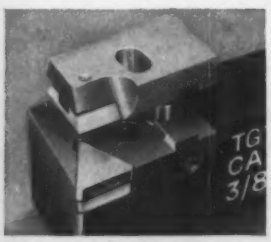
MORE jobs with LESS tooling—that's what this new Carboloy Adjust-O-Breaker toolholder means! No need now to have a separate chipbreaker for every cutting job. No need, either, to limit yourself to toolholders with only two or three chipbreaker settings. Now you can have this versatile new Carboloy toolholder and adjust it for *any* chipbreaker setting within its range.*

Available from stock in 5 styles, negative rake, for left- and right-hand machining, the Adjust-O-Breaker holder brings new meaning to disposable tooling.

So, if you want to handle *more* jobs with *less* tooling, look into the complete Carboloy line—Lift-O-Matic (positive rake, negative rake, and tracer), heavy-duty, and the new Adjust-O-Breaker toolholder.

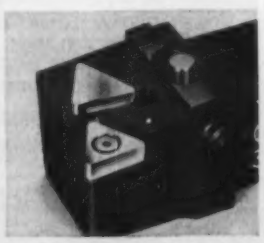


1. Chipbreaker setting is adjustable to any width within its range.* Set screw with two open ends provides access from either side. No springs to adjust.



2. Design permits absolute repeatability of settings. Floating chipbreaker is indexable. Can't drop out when clamp is loosened.

3. Clamp screw is accessible from top or bottom; allows easy indexing or replacement even when toolholder is vertical or upside down.



4. Standard disposable inserts, Carboloy insert seats and convertible seat are used with toolholder. Insert seats are indexable and self-aligning.

tool developments that mean
THROUGH BETTER TOOLING

2

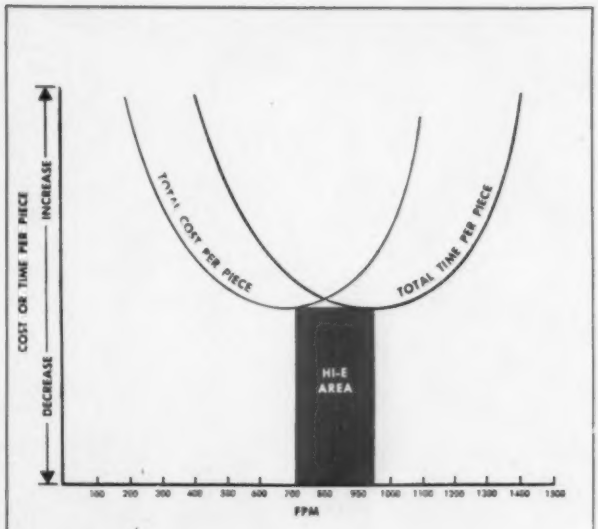
Here's how Hi-E machining pays big dividends . . . giving you BETTER PROFITS THROUGH BETTER TOOLING

In the light of current high manpower and equipment costs, carbide tools are low cost by comparison. Profitable operations result from the efficient combination of tool costs, manpower costs, and machine costs. In other words, tool costs should *not* be the only factor in setting up a job . . . rather, most efficient machining methods should be a major consideration. This calls for Hi-E!

Quickly defined, the Hi-E (High-Efficiency) machining practice brings together *all* factors to provide a range of cutting speeds for a given job to obtain (1) lowest cost-per-piece machined, or (2) reduced floor-to-floor time. Really, then, Hi-E machining can help you obtain the economical balance between *lowest possible cost* and *greatest possible production rate.*

The Hi-E area (see illus.) shows optimum speeds to obtain this balance. It is represented by an area on the chart between the lowest points on a total-*cost*-per-piece curve and a total-*time*-per-piece curve.

How can *you* employ Hi-E to get BETTER PROFITS THROUGH BETTER TOOLING? Talk it over with your Carboloy representative. He'll be glad to go into detail on Hi-E machining as it applies to *your* operation. Or write directly for your free copy of our detailed Hi-E booklet.


COST OR TIME PER PIECE
INCREASE
DECREASE
TOTAL COST PER PIECE
TOTAL TIME PER PIECE
HI-E AREA
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500
FPM

Hi-E principle is illustrated by the curves on this chart. The low points of the two curves mark the boundaries of the high-efficiency range.

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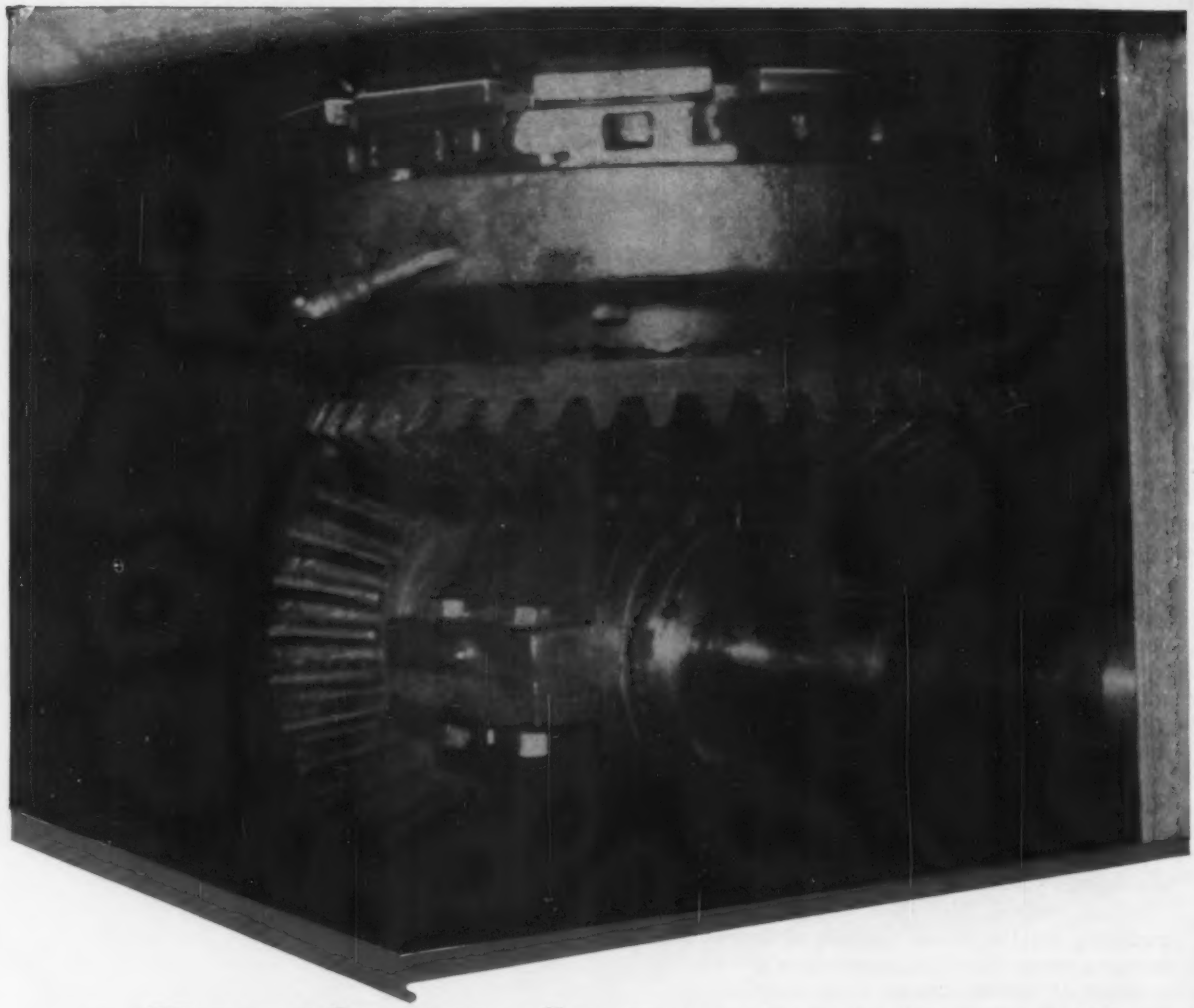

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Form Decorated Parts From Coils

New Process Turns Out Coils for End-Product Use

Here's a metal product that combines the advantages of continuous coils with the benefits of pre-coating.

The process includes a method for applying any decorative pattern that can be photographed.

By J. J. Obrzut,
Technical Editor

▪ A new process bonds a plastic coating to continuous coils of strip steel. Coil users will get higher standards of quality and appearance at lower production costs.

In addition to being processed in continuous coil, it can be fed into end-product steps from coils. This will eliminate hand feeding to production equipment without changes in existing tooling.

Despite being pre-decorated, it can be subjected to the same forming operations as un-coated steel. It frees the manufacturer from having to subcontract or engage in painting and finishing operations.

Trade named Miracoil, the new pre-decorated steel was developed by Enamelstrip Corp., subsidiary of National Steel Corp., Allentown, Pa.

Stress Coil Advantages — Explaining its importance in being in continuous form, A. E. Uhleen, executive vice president, states "From the standpoint of production volume and costs, the difference between stamping out products from continuous coils of pre-decorated steel, as opposed to fabricating them from cut sheets, is comparable to the vastly different economics involved in printing a large circulation publication on a modern rotary or hand printing press."

The new steel can be pre-decorated in any pattern that can be photographed—wood grains, leather, marble and others—in any color. The decorative surface is protected by the full thickness of the transparent, polyester plastic coating.

Withstands Abrasion — Tests of this coating in 0.0003-in. thickness prove it 10 times more abrasion resistant than materials presently in use for table, cabinet and counter tops. It's also unaffected by most acids and chemicals, oxygen and industrial fumes.

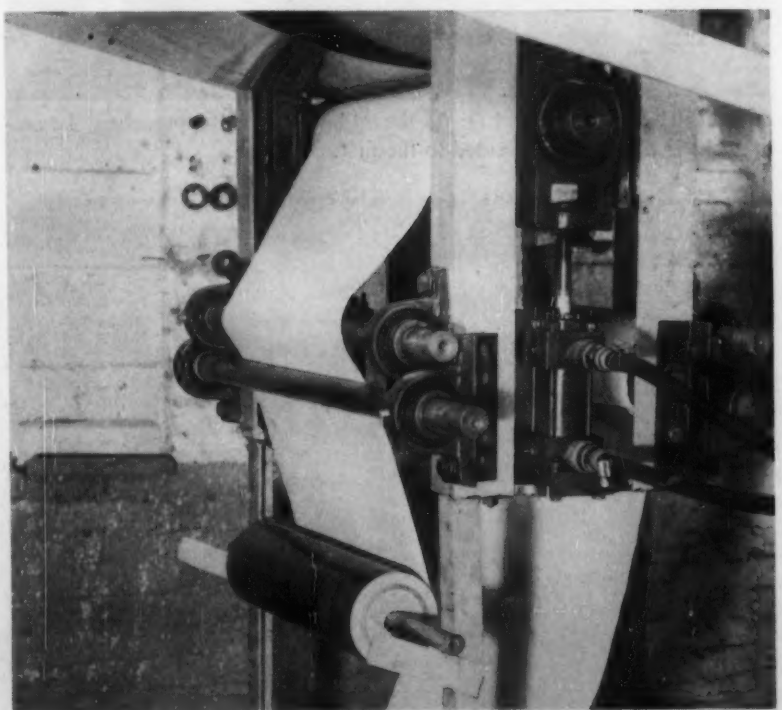
Present production is in widths up to 32 in. New facilities to be completed at Enamelstrip Corp. before the end of 1959 will turn out 48-in. widths at 300 fpm.

The appliance industry will be able to use this width as protective-decorative wrap-around material for kitchen cabinets and refrigerators. The material can be produced in the whitest of white which will not fade, yellow or deteriorate.

Readymade Uses—Miracoil will be a supply for the building industry as pre-decorated wall paneling for office buildings, motels and homes. Over 500 wood grain patterns will be available.

Another role is envisioned in the home trailer and truck trailer industries. Home trailer production experts estimate it can cut costs by as much as $500 per unit.

While the sheet material cannot



ALL IN ONE FILM: Decorative film is fed between pressure roll (top) and coil stock to form final finish. Color is already in adhesive.

be used where heat welding is involved, it's expected that its potential will accelerate research for developing adhesives to replace heat welding methods.

Future in Marketing — Mr. Uhleen comments, "We know of many end-product uses into which Miracoil can move immediately. Progress in creating new adhesive and new heat joining processes and creative marketing will uncover many more high volume sales areas."

The coating material is a polyester thermosetting plastic. It's the criss-cross molecular structure and lack of "memory" that makes it so suitable for the job.

Although this plastic has previously been used for coating steel in cut sheets, control of thickness was the tricky problem. Now Enamelstrip's process solves this problem for coating continuous coils.

Key in Applicators—The core of the process is in the applicators or rollers used. These units were designed and built by Mr. Uhleen.

In the process, pigment is added to the adhesive which bonds the plastic to the steel. This part of the process requires a special family of adhesives.

The advantage lies in eliminating the cost of a material and a procedure that are parts of conventional coating methods. Thus the coating is both the base coat and the adhesive.

New Photo Method—As suppliers of the plastic decorative film to Enamelstrip Corp., Di-Noc Chemical Parts, Inc., Cleveland, played a vital part in the development of the process. Di-Noc learned how to apply the plastic in liquid form to a paper web.

On the web is laid a fine photographic film. It creates a single film for decorative application to metal.

Users can obtain Miracoil coated on both sides. It's a low-cost protection to both sides, since it's done in the same processing operation.

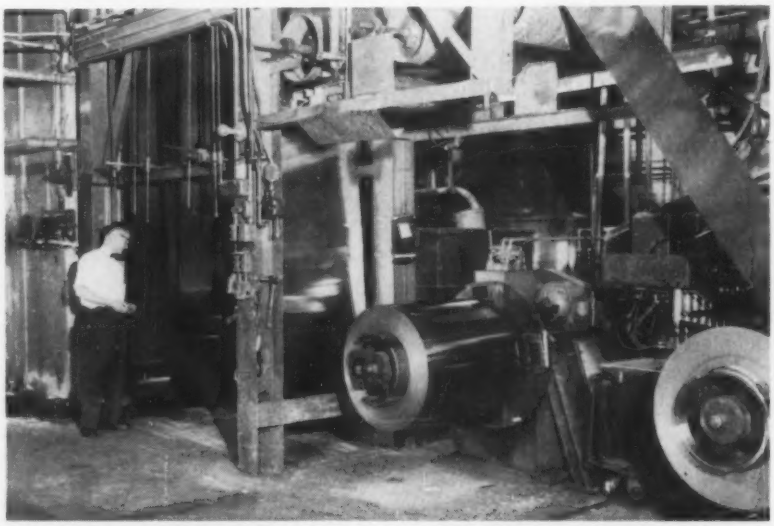
At the start of the process, a lift truck places a 10-ton coil of steel onto a coil ramp. The ramp feeds to either one of the two tandem uncoilers so there's no break in production.

Five-Tank Sequence—As the end of a coil already in process nears, the starting end of the new coil is joined to it by a double seam weld. Then the new coil enters into a five-tank washing, treating and drying section.

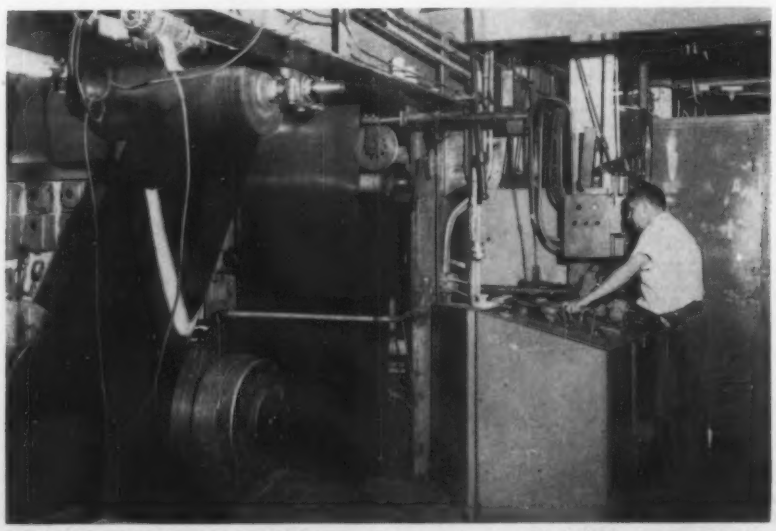
First comes an alkali cleaner, then follows a hot water rinse, a metal treating pressure spray and immersion, a room-temperature water rinse and finally a chromic acid rinse.

Equipment in this section includes stainless steel jet nozzles and squeegee rolls following each tank. Coil plate-type immersion heaters with steam as heat source supply solution heating where necessary.

Control for Solutions—Solutions are pumped in individual sections from 1000-gal tanks. These tanks have dividers so that return pumps can push solutions in one side of a divider to the exit side of the tank where they are again pumped back



CONTINUOUS COIL FEED: As the end of one coil approaches, the second coil is double seam welded to the first.



READY FOR END PRODUCT: As pre-decorated coil is rewound, it's ready for forming and stamping with no further finishing required.

into the sections. There's ample time for settling and filtering.

Recording-control pyrometers control solution temperatures by activating solenoid valves at the temperature source. Solutions are titrated every 15 minutes with detailed records kept.

Next the coil travels through a vertical dryer where all traces of moisture are removed. Then comes the vital pre-heating step.

Determine Quality — This phase determines the ultimate bond and the quality of the coating's gloss and texture. It also serves to partially cure the metal for coating from the inside out.

Meantime, the plastic material is being preheated in heaters that are located within 12 in. of the liquid-metal contact point. Rigid temperature controls insure coating under perfect viscosity with minimum use of solvent.

Now the metal is ready to flow into a composite, two-unit oven. It travels through this dual oven at a curing temperature of 300°-600°F depending on the gage of the metal and processing speed.

Choice In Application—Just prior to curing, the coil flows by two applicators which apply a coating to both sides of the metal at the same time. This both-sides coating is done in the same color and in the same thickness or, in different colors and in different thicknesses, depending on the customer's requirements.

On the decorative surface the new adhesive is applied, while the reverse side gets a protective or protective-decorative coating, again depending on what customers want.

As the coil comes from the dual oven, the protective coating on the reverse side has been cured. However, the adhesive-type coating on the decorative side is tacky.

Feed to Pressure Rolls — It's ready for the application of a plastic decorative film. This film is fed to pressure rolls from a roll located immediately below the dual oven.

This surfacing film may be used clear or as a printed film with any type decorative pattern that can be photographed. The final finish is dependent for color upon the pigmented adhesive applied earlier in the process.

As soon as the continuous coil leaves the pressure roller which has applied the plastic film, it passes into the cooling section. Here, the metal—from a temperature of about 350°F or higher—is "shocked" to a temperature just below freezing.

COATING WITHSTANDS WORK: Examining cabinet that needs no further finishing is A. E. Uhleen, executive vice president, Enamelstrip Corp.

Tests Point up Performance

Test	Procedure	Results
Humidity	1000 hours at 100 F, 97 pct relative humidity	Excellent bond; no sign of blistering
Abrasion	1500 cycle with CS-17F wheel and 1000-g weight (Taber Abrasor)	No evidence of failure
Steam Resistance	Tested 1 hour, 3 in. away from steam jet	No evidence of failure
Stain tests	10-pct hydrochloric acid; 10-pct sodium hydroxide; 70-pct alcohol; mustard; vinegar; lemon juice; gasoline; carbon tetrachloride.	No effect
	10-pct citric acid; household detergent; shoe polish; beet juice; dye; ink; iodine; phenol.	

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Single-Shot Diecasting Speeds Assembly of Intricate Parts

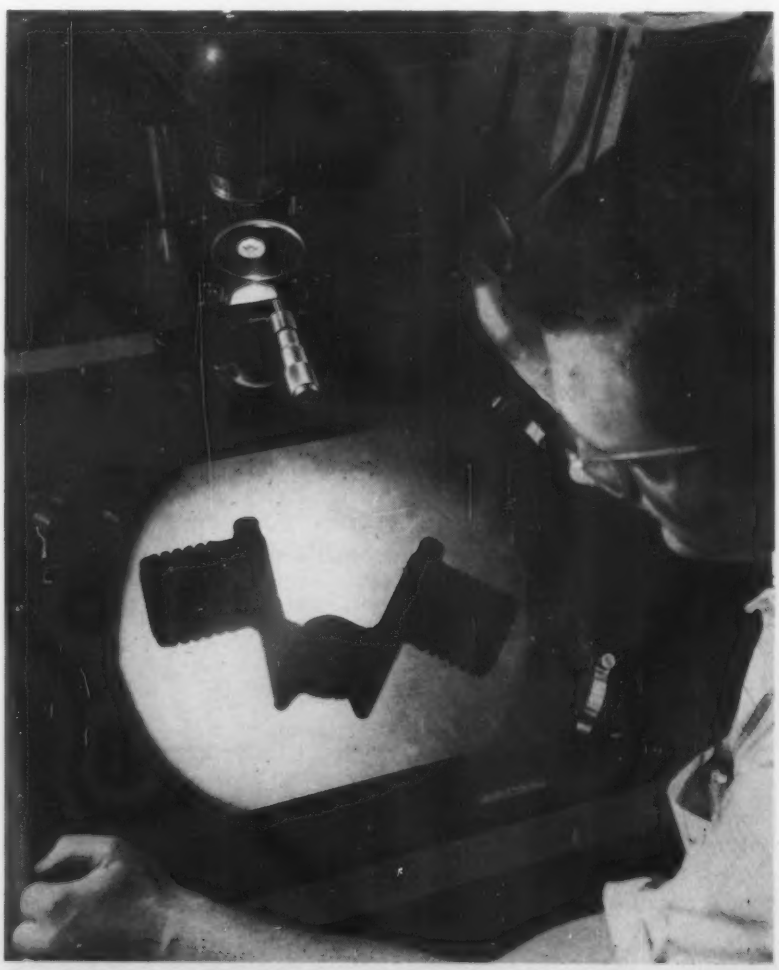
Diecasting production can reap many benefits from this improved technique.

You can measure the many savings in dollars and time.

▪ The problems involved in casting small, intricate or linked parts may be solved by a special diecasting technique. Using specially-designed automatic machines, industry's now diecasting zinc-alloy products in one shot.

The new process, known as Intercasting, is a development of Gries Reproducer Corp., New Rochelle, N. Y. With it, it's now possible to cast, at the same time, two or more movable parts that complement one another.

In the same step, parts are not only cast, but trimmed and ejected from the die in one motion, all ready for immediate use. The only thing the process doesn't do is apply a coating, if it's needed.



PASSES THE TEST: Intercast eye-glass hinge passes inspection on an optical comparator. Diecasting of such parts is done in one step.

Greater Output—The Intercast process is a step up from GRC's method of automatic single-cavity diecasting. In these days of high-volume mass production, anything less than 20 parts at a shot seems outmoded.

But, when you compare conventional diecasting methods with production rates of 2 to 15 shots per minute, to the better than 100 cpm in high-speed automatic techniques, you can see the savings.

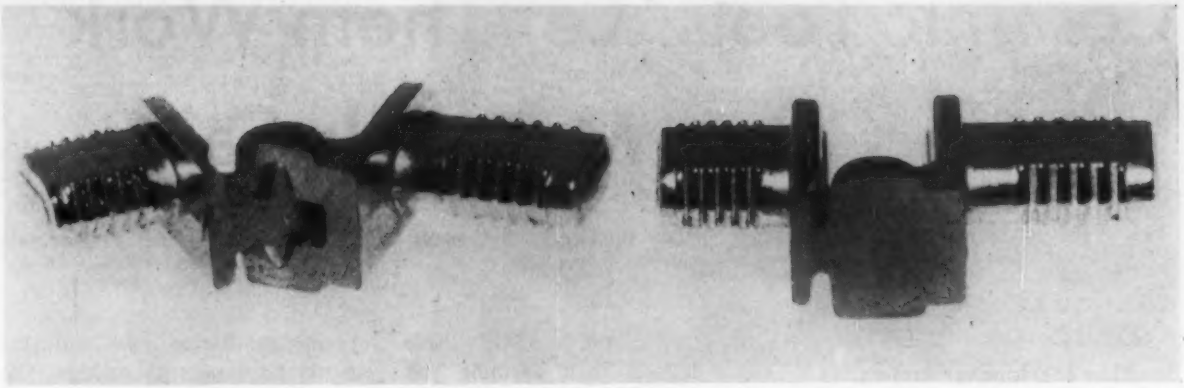
And since all parts are produced from the same cavity, dimensional uniformity from piece to piece is quite high. Naturally, this eases hand or automatic assembly operations. In contrast, it's possible for part dimensions to vary in conventional multi-cavity diecasting.

Down Go Costs—What savings can you count on? By using this one-step method of producing complex parts that have movable elements, you eliminate assembly costs. And, since there's no machining and very little handling, you can cut labor costs down to size.

You can also cut down on the amount of materials. Finally, you achieve high production rates at a low tooling cost.

Used in Luggage — Intercasting used on pad catches in magnesium luggage makes good use of all these advantages. In the old two-piece assembly method, the pad catch required three machining steps-drill, face, and stake.

Still another operation was needed to finish the job: a hinge pin to join the parts. When the company changed over to Intercasting, production costs dipped some 50 pct.



CLOSE FIT: New diecasting method disguises the line of separation between the movable elements.

The new method does more than just cut unit costs. It provides some design advantages too. You get a perfect fit of mating parts. That's all due to the cast-assembled construction.

See for Yourself—Look at the hinge in photo above. It's been ground down to expose the mating pin and recess. Note the hinge in the closed position (right). In it, you won't see the line of separation between the interlocking parts. How else can you produce a closer fit without interfering with the normal joint of the movable elements?

Parts produced by this method have an upper weight limit of ½ oz and a top size limit of 1½ in. The minimum weight is unlimited and the metal used is a zinc alloy.

Since the as-cast surfaces are quite smooth, most of these products can be bulk finished by low-cost barrel techniques.

Other Uses—What other parts can profit from Intercast's design advantages? Self-aligning bearings for one. Or hasps, ball joints, pulley and swivel combinations, and even continuous link chains. In fact, you can turn out chains, various shaped elements and all, in lengths of thousands of feet.

It makes no difference whether the parts are pivotal or hinged, whether the fits must be smooth, tight or loose. The Intercast process handles them all.

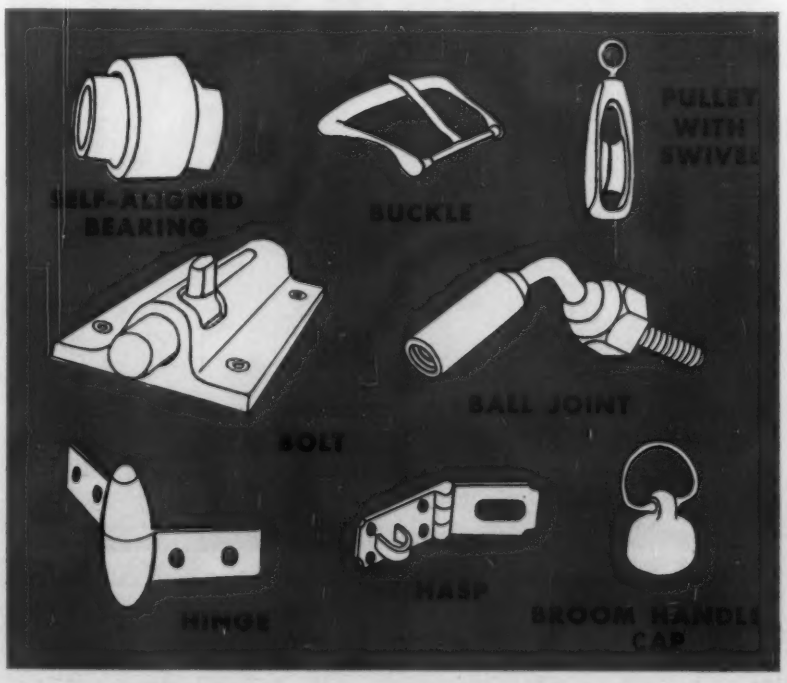
Too Many Steps—One company produces simple, everyday binder rings. The old method used up eight steps. First, workers cut off two pieces of wire. Then they straddle-milled the hinge-end half. Next the hinge end of the mating half was slotted. Following that, they drilled a small hinge hole.

The fifth step included milling interlocking nibs on the open end of each piece. Next, they cut a hinge pin from the wire. Finally, they were able to form the binder rings into a semicircle. At last, a hinge pin was used to assemble the two halves. Eight steps.

Reduced to One Step—Think how much easier it is, now that the manufacturer is using the Intercast method. As the first half of the ring is diecast, the zinc alloy quickly reaches a solid state. And its ends become part of the die for the second half.

The metal for the second half enters a split second later. It flows around the tongue, through the pivot hole of the solid first half, finally forming a single assembly. The binder rings are completely hinged assemblies when they come from the die all in one step.

Casts Moving-Part Types



Ceramic Tools: Let Them Work Where Other Materials Fail

By Horace Frommelt—Spring Garden Institute, Philadelphia

Machining with ceramics is handling the tougher metals.

Aside from filling some current voids, ceramics show great promise for the future.

▪ Ever since tungsten carbide made its entrance on the machine tool scene, it has done excellent work. But now another material is making headway in the same area. The material? Ceramics.

Ceramics have finally come of age. They can stand up to heavy-duty turning jobs. They can turn 63 Rc material up to 350 sfpm.

Ceramics can take reasonable interrupted cuts. And they leave better finishes than anything you can name, including carbide.

Taking Over?—Does this mean that ceramics are replacing carbide? Not at all. They are simply supplementing carbide. Such heavy jobs as 180-hp turning on 35-ton steel mill rolls belong to tungsten carbide. Nor should ceramics claim the work of heavy, interrupted cuts, both single-point and multi-tooth.

Carbide is being used for drills, reamers, taps, burrs, dies, and other chip-making duties. None of them are suited for ceramics. Not yet, at least. Also, many of the routine machining jobs will and should be done with carbide. For the next five years, at any rate.

For the Harder Range — But everything above 55 Rc hardness should be reserved for the newcomer. And all jobs that require finishes finer than 60 microinches should use ceramics. Where spindle speeds suit ceramics, whether it be turning or milling, ceramics are a better choice.

You can use a simple rule-of-thumb in setting up speeds. Where carbide milling rates call for 500 sfpm, just triple the figure to get a starting point for ceramics.

Series of Tests — Forty horsepower (gross) certainly isn't considered heavy duty nowadays. In fact, most lathe operations are well below that level. So to prove that ceramics could handle some of the more rugged jobs, Spring Garden Institute, Philadelphia, ran a series of cuts using standard size blades.

These blades were ⅜-in. inscribed circle and ⅛-in. thick. They were set up in a standard shank, providing negative angles, 5° back and 5° side rake. Table 1 sums up more than a dozen of these runs, made on 1045 steel using a 30-hp Monarch unit.

Each depth of cut started with 1/16 in. and ended with ¼ in. The high rate, 1500 sfpm, was maintained to prevent damage to the lathe when a 90 pct overload was called for. These results are intended to show the ability of ceramics to stand up to large horsepower cuts.

Material Side—Now to the other end of the cutting spectrum—to

CARBIDE TRAITS: Tests run on Monarch lathe using both carbides and high-speed steels give results opposite from those of ceramics. Increasing the depth of cut brings about decreases in surface speeds.

material. The 52100 material in Table 2 had been heat treated to a very hard 63 Rc. Only ceramics can remove metal from a parent piece that hard and do it at a fairly good shop rate.

The tool life cycle in the 52100 metal represents the time the edge is actually making chips. Not the time elapsed. The latter may be as much as 30 minutes, depending on the size of the piece. Whether the chuck is manually or mechanically operated has a lot to do with it too.

Fast Work—This same job has a feed rate of 1.8 ipm. In other words, you can turn a bearing housing 6 in. across the face in 3½ minutes. For the record, standard geometries (five-five negative) remain unchanged for this run.

The largest available lead angle, 30°, was used. This gives as much protection as possible to the edge in standard shanks.

Also, since the finish had to be better than 60 microinches, the flank wear end was held to 0.010 in. By extending this to 0.030 in., tool life could last 15 to 20 minutes. Such work, of course, is far beyond the range of carbide.

Traits of the Others — On the other hand, it's evident in Table 3 that, with high-speed steels and carbides, as the depth of cut increases, the surface speeds decrease. Likewise, the speed must be decreased as the feed rate increases.

For example, at a ⅛-in. depth for the same tool life, the surface speed decreases from 760 to 340 sfpm as the feed increases from 0.010 to 0.040 ipr.

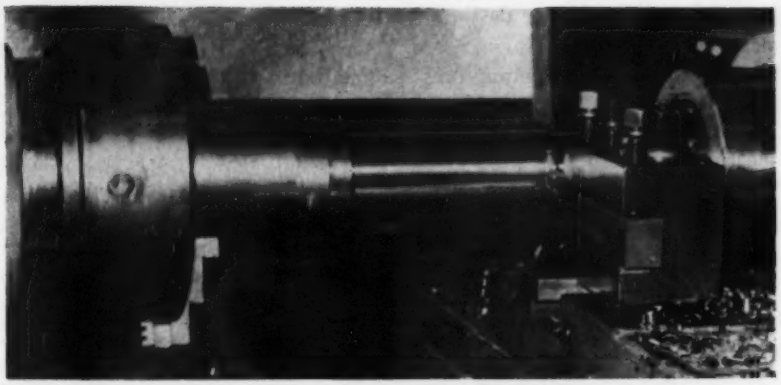
Machined Forging—One component, forged from 4140 material, was first handled by carbide. The first step involved turning in a tracer lathe with carbide. Then a centerless grinder provided final finishing to 30 or better microinches.

But now, in one pass, ceramic blades remove the metal to precise tolerances and leave finer finishes than you can get with practical grinding setups. And there's a 30 pct saving in time.

In One Step—Take another case, a 4140 sleeve. Heat treated to 50 Rc, this sleeve required boring to a close 0.0005-in. end-to-end ID. Ceramics did the job in one operation.

The time needed to complete the job was 1¼ minutes, as compared with 1½ hours using conventional grinding techniques. And ceramics gave a better finish too.

Less Cutting Force—Another advantage in using ceramics on this sleeve is in the reduction of cutting



TURNS STAINLESS: A ⅜-in. inscribed circle triangular bit of VR-97 ceramic turns 4-in, diam Type 305 part at 1200 sfpm. The corresponding tool life is 30 minutes. It's an economical machining job.

Ceramics Turn Carbon and Chrome Steels

TABLE 1—WORK: CLEAN, HOT-ROLLED 1045 STEEL, 200 BHN

Depth of cut, in.	Feed, ipr	Rate, sfpm	Horsepower
0.062	0.005	1500	5.5
	0.008	1500	9.3
0.125	0.005	1500	12.5
	0.008	1500	19.0
0.187	0.005	1500	17.0
	0.008	1500	29.0
0.250	0.005	1500	35.0
	0.008	1500	39.0

Cutting element, VR-97 ceramic. Tool profile: nose radius, 1/16 in.; side cutting edge angle, 0°; and −5° both back and side rake. Dry cutting fluid.

TABLE 2—WORK: CLEAN, HEAT-TREATED 52100 CHROME STEEL, 63 Rc

Depth of cut, in.	Feed, ipr	Rate, sfpm
0.100	0.004	290
	0.006	260
	0.008	225
0.075	0.004	310
	0.006	280
	0.008	240
0.050	0.004	360
	0.006	300
	0.008	250
0.025	0.004	400
	0.006	350
	0.008	300

Cutting element, VR-97 ceramic. Tool life, 8 minutes. Profile: nose radius, 1/16 in.; side cutting edge angle, 30°. Flank wear land, 0.010 in. Dry fluid.

forces, yet maintaining the same metal removal rate. The higher surface speeds reduce the cutting pressures.

Again, the standard five, five negative tool geometries were used. Workers will go along with this. Added protective angles are never welcomed in the shop.

In Aircraft — Ceramics should find wide areas of use in austenitic steels. Airframe specs for the forthcoming 2500-mph class call for such a metal, Type 305. The main problem with these materials is one of work hardening.

Carbides give good production rates. But ceramics have even more to offer. Turning of a 4-in. diam component is possible at the rate of 1200 sfpm with a corresponding tool life of 30 minutes.

The 0.006 ipr feed rate gives finishes better than 60 microinches. And there's a generous metal removal rate, due to the 7.2 ipm feed rate.

For Ceramics Only—But don't conclude that ceramics are going to replace carbides. These materials can work hand-in-hand. However, there's one area where only ceramics can work. That hardness range above 45 to 50 Rc must be done with ceramics.

And in super-finishing too, using such machining methods as turning and boring. Very often, it means eliminating an extra step, like grinding.

The austenitic steels offer a real challenge to ceramics. As stated before, these materials, including the stainless grades, tend to work harden. That is, changes in their space lattices take place due to the machining problems brought on by cutting pressures.

You Can Avoid It—The way to by-pass this problem is to step up surface speeds to keep ahead of the space-lattice changes. Ceramics lend themselves to such high rates, aided by their smaller feeds per revolution.

Although carbides can operate the rates up to 500 and even as high as 1000 sfpm, they can't top the higher surface speeds of ceramics. Also, to get lower cutting pressures with carbides, you should use positive angles.

On Thin Sections—Ceramic cutting elements are suited to thin-sectioned workpieces too. When there's a tendency for chatter, due to the tight fit of the parts, cutting pressures must be reduced. This is done by holding firm on the metal removal rate but raising the surface speeds.

Take the turning of a thin-walled tube of stainless steel, for example. Suppose its carbide cutting specs are 500 sfpm and 0.005 in. feed rate and a depth of 0.050 in.

Under these conditions, when working on a 4-in. diam OD tube, metal removal rate is 1.3 cu in. per minute.

Pressure Drop—If this is done at 500 sfpm, the cutting pressures are 86 lb. On the other hand, by maintaining the same metal removal rate through the use of ceramics, then raising the surface speed to 1500 sfpm, pressures drop from 86 to 29 lb, or one-third of the carbide-cutting pressures.

Many people contend that ceramics won't absorb the shock treatment you have in interrupted cuts or in milling. But, recent studies reveal success in placing aluminum foil under ceramic cutting bits in steel shanks. At any rate, the damping of vibrations reduces the shock. That leads to longer tool life and better finishes.

As a note of interest, the damping effect of copper-impregnated tool shanks helped achieve the results in these studies.

How High-Speed Steel and Carbide Compare

TABLE 3—WORK: CLEAN, HOT-ROLLED 1045 STEEL, 170 TO 220 BHN

Depth of Cut, in.	Feed, ipr	High-Speed Steel, sfpm		Tungsten Carbide, sfpm		Metal Removal Rate (Dry)	
		Dry	Oil Coolant	Dry	Oil Coolant	Cu in. per minute	Horsepower
1/32	0.010	160	195	1100	1300	3.8	4.1
	0.020	105	120	725	850	5.1	6.0
	0.040	70	80	500	550	7.0	8.0
1/16	0.010	120	135	850	990	5.9	7.0
	0.020	80	90	550	650	8.0	9.0
	0.040	50	60	375	425	10.1	12.0
1/8	0.010	90	100	640	760	9.3	11.0
	0.020	55	65	450	510	12.5	14.0
	0.040	37	42	280	340	17.0	19.0
3/16	0.010	80	90	600	660	12.5	14.0
	0.020	50	60	375	450	16.0	18.0
	0.040	34	40	250	290	22.0	25.0
1/4	0.010	75	85	550	600	15.0	17.5
	0.020	40	55	350	400	20.0	24.0
	0.040	31	36	220	255	27.0	30.0
3/8	0.010	70	80	500	560	20.0	24.0
	0.020	45	50	325	475	27.0	30.0
	0.040	29	34	205	237	35.0	40.0

Single-point tool, 10-minute life. Profile: nose radius, 3/64 in.; side cutting edge angle, 0°. Flank land wear, 0.030 in. Horsepower per cu in., 0.76.

Stainless Lands Nuclear Job

Provides Protective Shell for Nontoxic Battery

Very often, the right metal has to suit many needs.

And here's a case where stainless Type 302 outperforms the others.

▪ The use of stainless steel for a new nontoxic nuclear battery helps keep production costs down, according to a New York company, Radiation Research Corp. Other choices for the deep-drawn shell include molybdenum, nickel, and Monel, all more costly metals.

This space-age battery contains krypton-85, at 140 psig positive pressure. Krypton-85 was selected because, unlike some radioisotopes, the gas isn't absorbed by the human body.

Four Reasons Why—There are four main reasons why stainless Type 302 won the nod over the other metals. First, it's easy to fabricate. Second, the alloy accepts a pressure-proof braze. Third, it resists corrosion under a wide variety of conditions.

And finally, Type 302 is available from commercial sources at costs lower than the other metals. Only Type 302 stainless could meet all four of these design requirements.

And there is one more point in the alloy's favor. Stainless remains stable under irradiation, though this wasn't a design factor.

Holds Tolerance—Ratio of shell diameter to depth of draw is more than 1:2. This presents a certain problem since the 50-mil wall thickness must be controlled within 0.003 in. during forming.

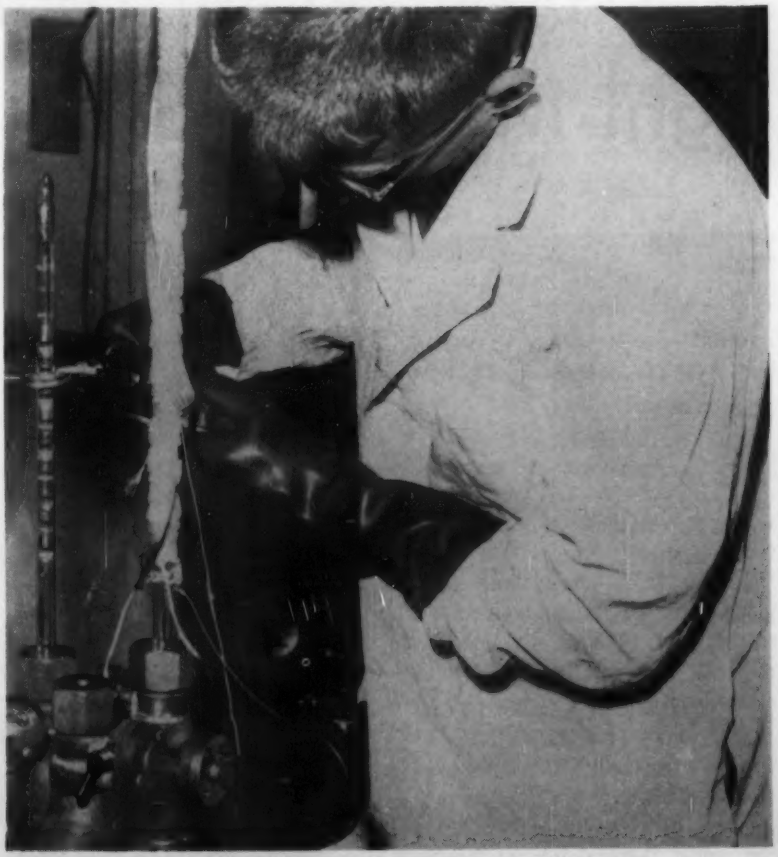
But Type 302 clears this hurdle with ease. Thanks to the alloy's drawability, standard pressing methods keep it within tolerance during production.

Induction brazing with silver alloys joins the stainless shell to its cap. But, before assembly, the shell lip's shaved within 0.002-in. tolerance on the diameter. By maintaining clearances of 0.001 in. between cap and shell, you ease the flow of the brazing alloy.

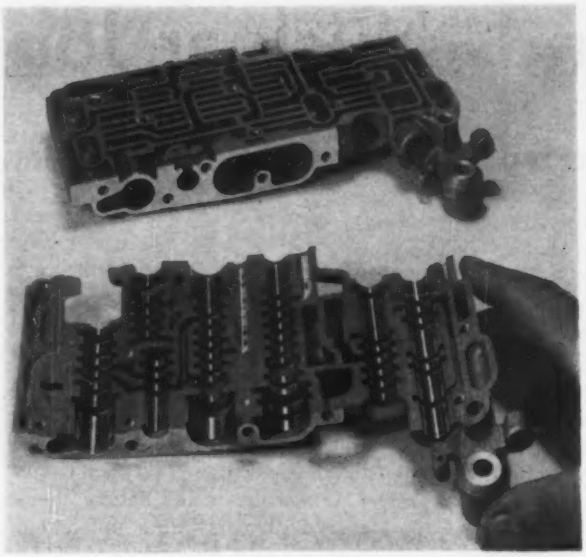
Leak-Proof Joints — After final fabrication, each one of these canisters undergoes a high-pressure helium-leak-inspection test. Pressure is at 25 atmospheres. Radiation Research is now achieving leak-proof joints on 90 pct of the cases in the initial braze.

The krypton-85 battery operates through use of a solid dielectric substance. Beta-particles from the krypton-85 gas penetrate the substance. And each 1-oz battery cell develops about 5 kv on open circuit.

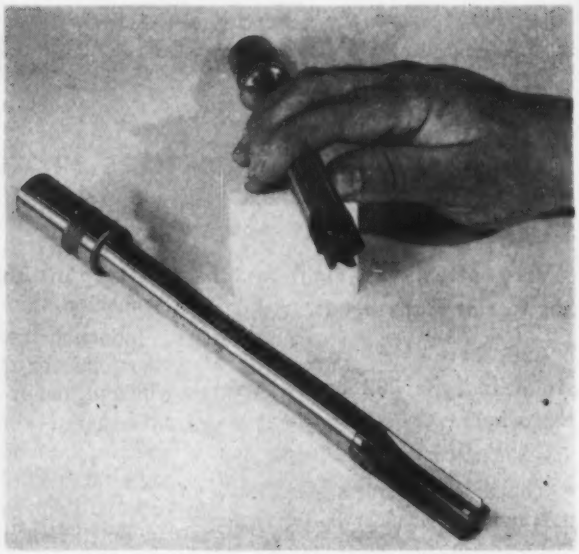
Useful life of the battery should exceed 10 years with a no-load current of 100 microamperes. Designed to perform at temperatures from —175° to 165°F, the battery's used in timing devices. It fills the bill wherever you need long-life power sources that aren't affected by external conditions.



INDUCTION BRAZING: The use of stainless in nuclear batteries guards against accidental release of radioactive krypton-85 gas following rupture. Induction brazing in a vacuum is the joining method.



FINE FINISH: Starbore reamers provide fine finishes on aluminum valve bodies in interrupted cuts.



COOLANT HOLES: Flute parts are carbide blanks, brazed to steel shanks. Each flute has a coolant hole.

Pressure-Coolant Tools Ream Light Metals to Size

By **George Larry**—Application Engineer, Star Cutter Co., Farmington, Mich.

It's a natural for pressure-coolant tools: reaming cored holes in diecastings and other aluminum parts.

▪ Production people are beginning to see the merits of pressure-coolant reamers. Where else can you transform rough-cored holes into precision ones in a single shot? At a glance, these patented reamers resemble the conventional carbide reamers. But they do differ in some extremely significant details.

In a quality tool, what's the function of a coolant? Does it act as a lubricant? Does it cool the surface? Or does it aid the chip flow? You can argue these points at length. But most tool engineers will tell you that a coolant should do all these things if you expect to get the most out of your tool.

Three Jobs in One—The coolant in Starbore carbide pressure-coolant reamers performs all these jobs with the utmost efficiency. Because, in these tools, small coolant holes are provided at flute ends that run out into the body of the tool.

This makes it easy for the coolant to handle its threefold job. You get effective cooling and maximum lubrication. And, best of all, you can readily force those chips out ahead of the tool.

But to force the chips out, it takes a properly-designed pressure-coolant carbide reamer. Tests in the development lab at Star Cutter Co., Farmington, Mich., haven't yet indicated whether it's the pressure of the fluid's volume that gives the good results.

Just a Little Pressure—However, the engineers do know that an increase in coolant pressure can spell the difference between success and failure. Even pressures as small as 75 psi can do wonders to pressure-coolant reaming operations. So the real key to the tool's success is the ability of the reamer to get the chips out ahead of the tool.

Consider the gun-reaming results on an 80 Bhn aluminum valve body for an automatic transmission. It's not easy maintaining hole size and finish requirements on this part. You're held to ±0.0005 in. with about 0.015-in. stock removal on a side.

Surface finish must be within 10 and 15 micromillimeters, rms, with

a maximum limit of 20 micromillimeters. And concentricity of the steps has to be within ±0.0003 in. true indicator reading.

Multi-Station Unit — The setup for producing these core-reamed holes is a Kingsbury center column 12-station machine. The operator clamps the valve body to work fixture.

He arranges both parts in face-up position. In all, the operation uses eight pressure - coolant reaming tools. Each one has a two-flute design.

A tool in such a setup rotates at a surface speed of 520 fpm. Feed is 6 ipm. The coolant is cutting oil at a pressure of 250 psi.

And each time the company sharpens its tools, you can count on an added 12,000 to 14,000 pieces from the line. In other words, the machine nets 120 pieces per hour.

The Old Way—This same company first decided to drill the cored holes with sub-land tools. Next came a reaming step with a variety of single and step-type pressure-coolant reamers. After the first day of operation, the drills were removed from the machine and the holes finished from the cored condition with the reamers in a single pass.

Another use of pressure-coolant reaming is in cast-iron diesel-engine cylinder heads. Here you ream cam follower holes from the cored hole. In this setup, the reamers produce a 1.040-in. diam hole having 0.002-in. tolerance from a rough ¾-in. diam cored hole.

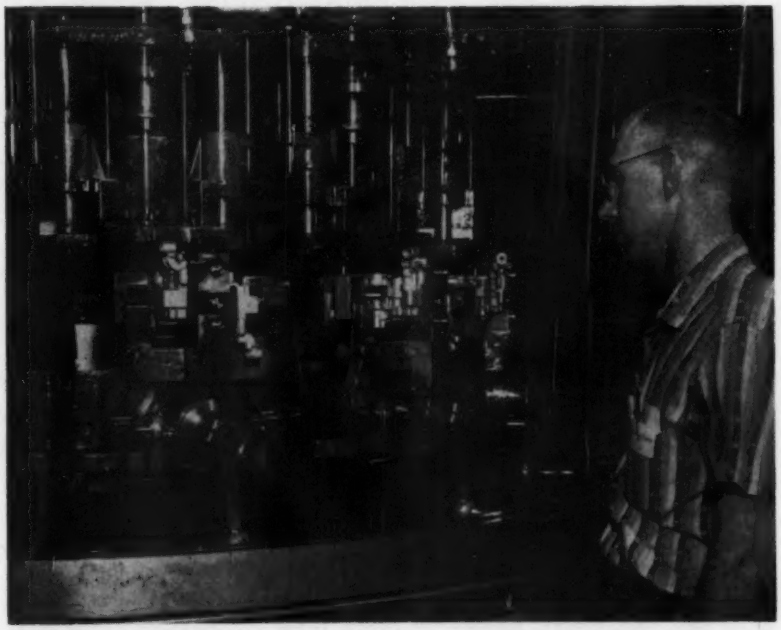
Three Positions — For the four reamers to produce the twelve holes, the work indexes through three positions in a Foot-Burt drilling machine. These 3-in. long holes must get a surface finish of between 100 and 300 mu, rms.

Tools rotate at surface speeds of 268 fpm. And they feed at 7½ ipm. The coolant used is oil. Its pressure is 60 psi.

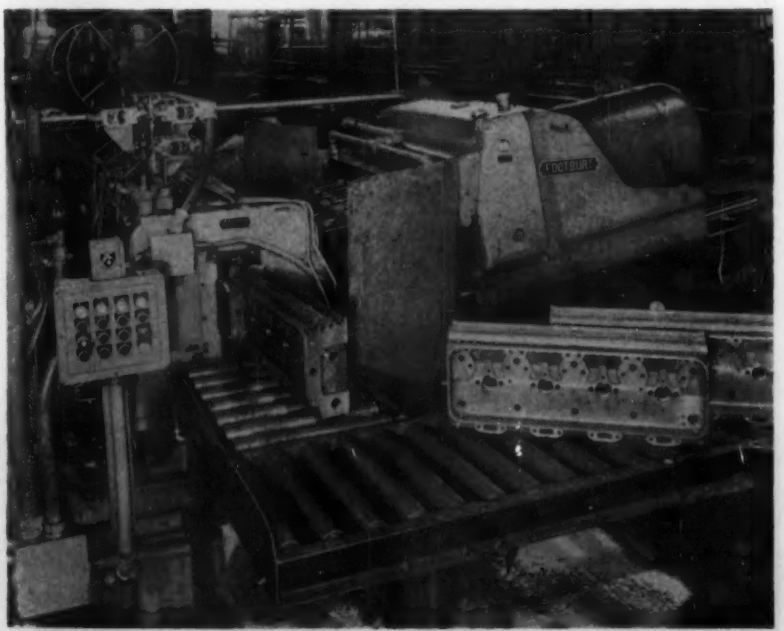
This machine produces 18 pieces per hour, while tool life is about 350 pieces per sharpening. The setup is designed to handle aluminum as well as cast-iron parts.

Design's a Factor—How carbide pressure-coolant reamers are made depends upon their end use. They can have anywhere from two to ten flutes, for instance. Or they can have either straight or spiral flute designs. But it's vital to suit the tool to the work.

In many cases, as you can see, these tools remove large amounts of stock in producing smooth holes.



MULTIPLE REAMING: Center-column 12-station Kingsbury machine reams holes in an aluminum valve body. Each tool has a two-flute design.



CAST-IRON REAMING: This setup turns out 18 pieces per hour in reaming cam follower holes of cast-iron diesel-engine cylinder heads.

How to Rate Your Press Shop

By Carter C. Higgins—President, Worcester Pressed Steel Co., Worcester, Mass.

Operating an in-plant press department is often prohibitively expensive.

It pays to know how to keep ahead of the mounting costs of stamping production.

▪ There are many concerns which make vital use of stamped components. They operate their own press departments. But, how many of these concerns actually belong in the stamping business?

Their costs are greatly affected by the efficiency of their press operations. Still, they seek to measure the effectiveness of these operations without the benefit of proper data—data that is available to job stampers after years of experiences.

Do they belong in this business or are their operations a luxury they can ill afford? Should they expand operations for new products or should they hold the line? Should they buy stampings on the outside and devote their stamping time and efforts to more profitable operations?

Too Many Variables—Ratios and generalities are of limited use in evaluating press departments. There are too many variables involved. Lengths of runs, differences in operations involved, percent of part value represented by materials, are just some of them. Despite this, some comments on press shops may prove helpful.

Obviously, if a large company is using only $10,000 or $20,000 worth of stampings a year, the efficiency of press operations is a minor point. The use of a press in straightening, piercing a hole in certain models, or even producing a special part, may be worth while because of the control given over production flow. It may well offset any inefficiency.

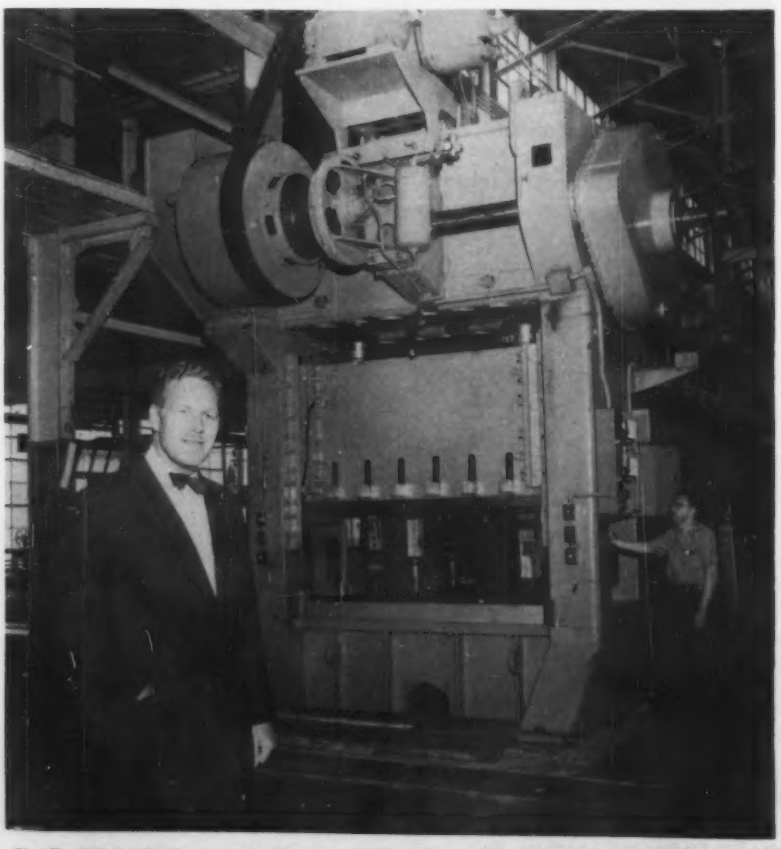
The odds are, however, that there will be great shortcomings in any press department producing less than $200,000 a year. Such an operation simply cannot afford the variety of skills essential to low-cost production. Like company cafeteria operations, it is too marginal.

Many Cost Too Much — The author has seen some very effective shops specializing in components needed by the concerns involved. On the other hand, he has also seen some press departments which are costing far too much.

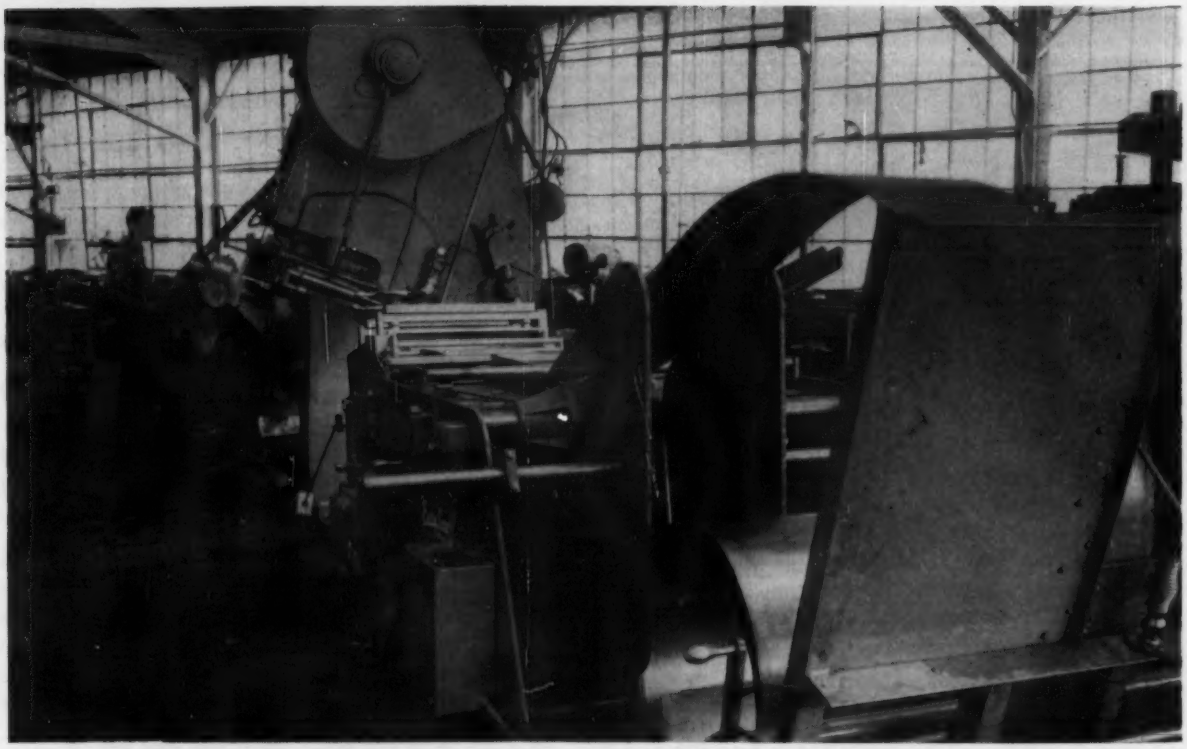
An inside press department has certain advantages. It is familiar with shop requirements. It knows what adjustments can be made to conform to what the die produces. And, in many instances, it can avoid repacking and shipping costs.

Obviously, there are disadvantages if we compare an inside press department with an outside supplier. Limited material purchases, a narrow range of equipment, and personnel policies geared to other operations are some of the shortcomings. These go with just having one customer—your shop.

Can They Compete? — Further-



C. C. HIGGINS: Points out that the location of equipment such as the 400-ton press in background is essential for efficient production.



USE COILS FOR SPEED: Special feeders are used to pass coils of stock through the flattener to this 150-ton press; blanking speeds are over 3000 strokes per hour. Motor is inclined for easy ejection of blanks.

more, too many inside press departments are shielded from the spur of competition. How well would they do if they had to stand on their own feet?

It is the policy of some companies to make everything possible—even washers and perforated metal—with existing skills and equipment. The reason given is "to absorb overhead."

The proper goal of internal operations is not to make a contribution towards absorbing overhead. It should cover all applicable overhead and show a return on investment. Internal operations must be competitive.

Fill Other Functions—Moreover, an effective press department should not only show a profit; other functions should be filled. It should be a valuable source of ideas to your company for product improvements. And it should supply trouble-free parts for later operations.

Effective quality control over stampings is dependent on several factors. Proper materials selection and understanding of dies are vital. Operating techniques, and inspection procedures are also very important.

Even on the most difficult parts, scrap percentages or the ratio of poor parts to blanks cut, should be well below 10 pct. An allowance of 1 or 2 pct is acceptable.

Bring Costs Into Open — Don't bury your scrap figures in overall departmental allowances. The author knows of one company that hides all operations required to correct improper stampings, by doing the job elsewhere in the plant. Scrap and fix-up costs—we all know how expensive it is to round sharp edges on large parts—must be brought into the open to be controlled.

Do your product designers, die designers, and material requisitioners work together to choose the most economical and satisfactory material specifications?

Material costs are fairly standard—except for freight—but checking this area can be worth while. For example, many parts requiring stock over 0.070 in. thick can be made of hot rolled material instead of expensive cold rolled stock. Or you can make it cheaper by using sheet material with larger tolerances than strip which is specially rolled in widths less than 12 in.

Select Proper Widths—Standard width sheets are economical. But what about the scrap left-overs? Most companies can't do much with 1- or 2-in. leftovers. Thus, selecting proper multiples of width is important.

A 36 x 93 in. sheet will yield 65 7-in. circles, or 44 8-in. circles. But the same weight of material, in sheet 48 x 93 in. will yield only 58½ 7-in. circles, or 42¼ 8-in. circles. The economy of the wider sheets thus depends on what you

can do with the 5½ and 7⅜ in. wide strips left over.

Another factor in material cost per 100 pieces is the degree of nesting designed into blanking dies. Take a look at your remaining skeletons to check this point.

Look for Economies—For more costly materials, running strips through a second time more than offsets the additional labor. In other cases, double blanking, either of the same parts, or blanking two parts used on the same end product, brings further material economies.

There has been a marked trend towards coil use, particularly in independent stamping shops. The cost difference betwen coil and sheet is less responsible for this trend than is the chance to double or quadruple blanking speeds.

However, since coil changing takes time, coil weights are less precise and setup is slower. Thus, principle economies are realized only on runs of 10,000 pieces or more using at least two coils of material.

Prefer Coil Use — Almost all progressive die jobs should be run using coils, until you get into stock over 0.093 in. thick which is hard to uncoil. But in many press departments, the ten thousand dollars spent on uncoiling and flattening equipment would be quickly paid off, provided a short, stroke-press is available.

There are a number of ways whereby direct labor costs can become excessive; low operating speeds of equipment are a good example.

Speeds of 500 stamping an hour are about the lowest that can be competitive. Exceptions are bulky parts and some multi-stroke operations. With coil equipment, speeds for blanking, compound blanking, or progressive work should run from 2000 to 10,000 strokes an hour, even on 150-ton presses.

Design Raises Costs—Die design, as well as low speeds, can cause excessive direct labor costs. The first effort of good die design is to minimize the number of operations consistent with tool budgets. There are exceptions, of course. Two fast operations can cost less than one slow one or can cut down scrap or breakage of parts or tools.

But there is a definite trend towards accomplishing as much as possible at each stroke of the press. This may be done by running parts like large junction boxes progressively, setting dies side by side in long bed presses, and so on.

The shop with only small bed, straight side or gap presses, not tied together by automatic devices, is limited in its ability to compete.

There are other reasons why labor costs get out of hand. Overcrowded press departments slow the moving of materials and scrap. Moreover, if the department layout is such that presses cannot be moved, then parts must be trucked long distances rather than being slid or conveyed.

What About Overhead? — The question of how much overhead can be actually applied to a press department job, or even to a group of jobs, is open to review. Obviously, overhead is fixed for a 1- or 2-pct expansion.

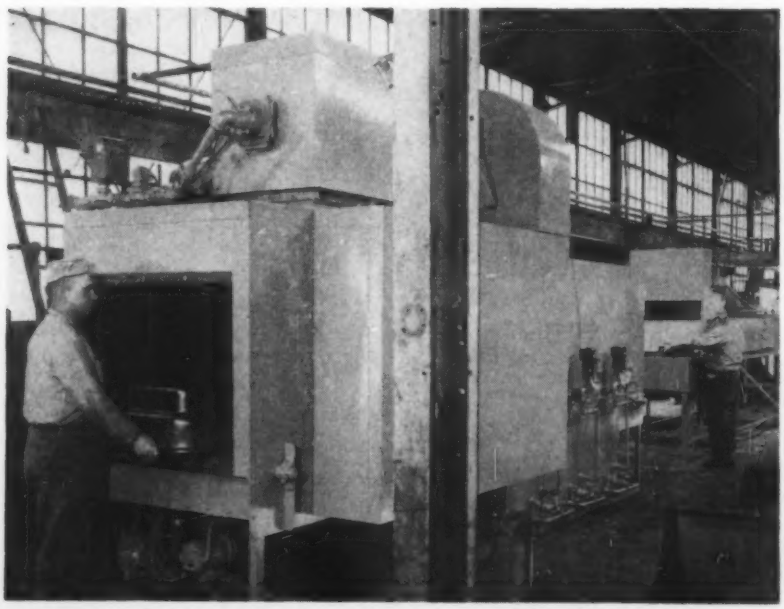
For a 10-pct expansion, it is partly fixed. For a 50-pct expansion (or contraction) it is not fixed.

The danger is that a slowly accumulating overhead, based on a number of small cases, may suddenly loom up way out of proportion. Applying too high an overhead rate counts against the press department when figuring costs. Yet, use of too low a figure is only deceiving yourself.

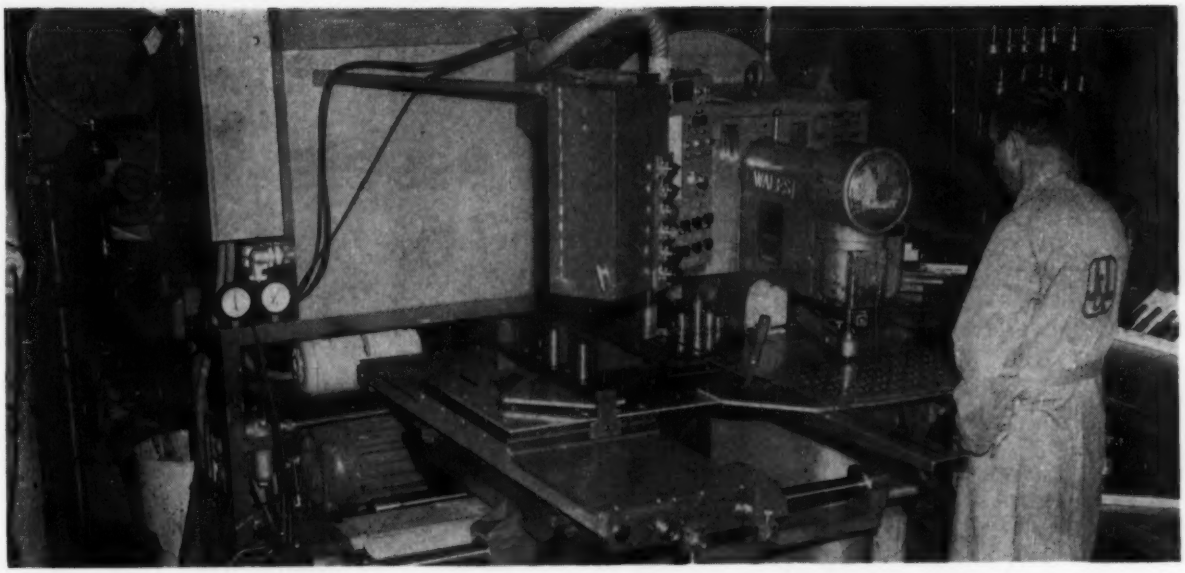
Include Major Part — Product design and marketing costs will not be affected by a substantial increase or decrease in your press operations. But most other expenses will; they are not as fixed as we assume. Therefore, a major part of total overhead should be included when measuring your press operations against outside figures.

Set up goals for your press production. Bring your cost elements out. Encourage capable supervisors to work on methods, quality, and continuing improvements.

Check against outside prices, as you cannot afford to pay more for your parts than your competitors. It's not wise to continue a press shop that's yielding a minus return.



NEED LUBRICANT: Such operations as lubricating before further annealing find their way into stamping costs and must be properly planned.



ACTS AS ONE: The whole machine is really three separate units: punch press, positioning table, and control unit. In this way the table and controls can be moved to another setup, if needed.

Tape Controls Aid Punch Press

Not getting enough from your present punch press?

Then tie it in with a positioning system.

▪ Does it pay to adapt a positioning system to your present punch press? Engineers at Western Electric, Burlington, N. C., will answer yes to that question. They had a Wales Strippit unit. And they wanted to position a workpiece on it.

So they contacted Jones & Lamson Machine Co., Springfield, Vt. It was a natural move, since J & L already had a system for drilling. The problem was simply one of conversion.

Knew the Problem — Western Electric engineers knew what they wanted. First, close tolerances were needed in producing sheet metal or plastic chassis that had many mounting holes. Faster speeds too.

Also, they wanted short lead time on production runs. And, lastly, their machine would have to eliminate the delays and expense of special tooling in the form of multiple and progressive punch - and - die setups.

Now that the machine's running, it's punching up to 50 holes per minute. One run that used to take 13 hours only takes 5 hours with the new setup. According to Western Electric, it looks like a saving of $32,000 during the first year.

Automatic Setup—The machine's cycle is completely automatic, except for tool changes and workpiece loading. The improved setup now contains three main units: punch press, positioning table, and control unit.

There are three ways to operate the machine. First choice is automatically from tape. Here, the table positions, gives the punch a signal, signals the punch to retract, and gives the control system a signal to read in the next command.

Two Other Modes—In semiautomatic operation, the operator pushes a button to read in a command from the tape. When the table positions, a light goes on, signalling the operator to actuate the punch.

The third method is by manual controls. In this case, the operator dials in the desired coordinates on the manual selector switches. He then pushes a button to read in command. From there on, it's the same as in semiautomatic.

New Design—In converting the setup from drilling to punching use, Jones & Lamson designed a special base, saddle, and table, since workpieces used in punching are much lighter than those for drilling.

Also built into the setup are two standard 20-in. positioning units, and standard hydraulic, electrical, and electronic controls. Finally, the designers added intercabling to tie the punch press cycle in with the positioning cycle.

The table itself travels 20 in. both left to right and front to back. Positioning accuracy over the entire travel is ± 0.001 in. Repeatability is within 0.0005 in. and speed is 150 ipm.

Remote Device Controls Levels In High-Pressure Vessels

Hydraulic systems require exact readings of liquid levels if shears and presses are to run smoothly.

▪ It's not enough just to know the liquid level in a vessel that's under high pressure. Take a large hydraulic accumulator, for example. The hydrostatic pressure in such a setup may vary anywhere from 2000 to 3000 psi. And this is a normal range.

These pressures rule out floats, gage glasses, or instruments with stuffing boxes. Their use often results in costly downtime, brought on by leakage and the usual maintenance that follows.

But, if your plant uses a heavy hydraulic power system to operate its shears or forming presses, you should look into a better method to control those levels.

Truer Levels—There is a setup on one of the hydraulic systems at U. S. Steel's Fairless Works, Morrisville, Pa., that does quite a job. Made by Yarnall-Waring Co., Philadelphia, it's used on the system supplying the hot shears on a 45-in. slab mill.

This device is an accurate and reliable method of maintaining pressure. And it succeeds by controlling the level in the hydro-pneumatic accumulator. Water levels must be maintained above a certain mark or there won't be enough pressure to run the shears. Here, the operator can gage the level from his own station.

What Happens—First, the accumulator is charged by forcing water into it against a high-pressure air cushion. As the water fills up to the low level, an air compressor raises the pressure to 1900 psig. Then enough additional water is added to bring the pressure up to 3000 psig.

The level at this point becomes the high-water level of the remote indicating instrument. At the same time, the indicator's range corresponds to the difference between the high and low levels.

Next, as water is drawn from the vessel to run the shears, a series of pumps maintains the water level and the needed pressure. This means one thing. From his station, the operator always has a continuous, on-the-spot reading of the level in the accumulator.

Difference in Pressure — Within the remote indicator itself, two pressures combine on a diaphragm. There's a constant pressure on one side and a variable pressure on the reverse side. As the water level changes, so does the variable pressure. This, in turn, moves the diaphragm.

When this happens, this difference in pressure moves through a deflection plate, a magnet, and a spiral magnetic armature. Finally, the armature moves a counterbalanced pointer across a dial.

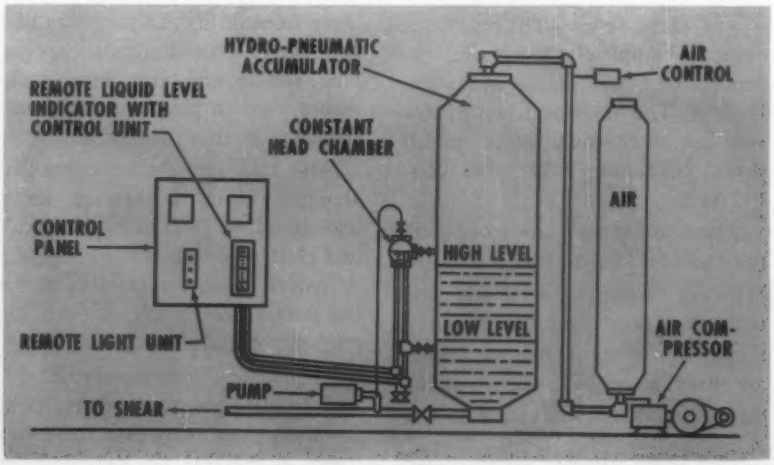
The control unit, attached to the side of the level indicator, consists of a two-pole permanent magnet. This is fixed to the rotating hub of the pointer, two relays, and two adjustable arms.

These arms can be adapted for two, three, or four magnetic switches. Movement of the pointer causes the magnet to rotate, thereby starting up these switches at preset levels.

Warning System—As an optional feature, the manufacturer can fit the indicator with a signal device. It's really an alarm system to warn the operator, by lights and a horn, that the level is above or below the preset range.

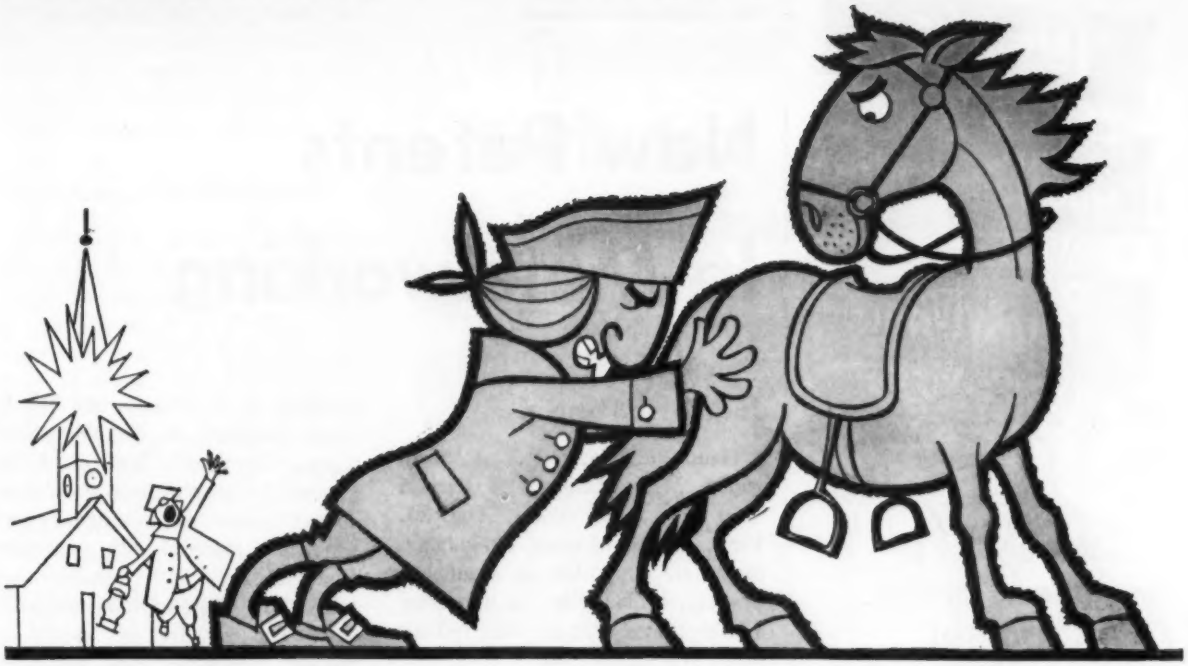
First developed to gage water levels in boilers, the indicator has since found use in many other areas. Some of these present uses are on feedwater heaters, deaerators, water softeners, and other tanks as well.

How the System Works



INSTANT READINGS: The level indicator is located at the control station. This insures enough pressure to run the equipment.

Man's Eternal Struggle with the Machine



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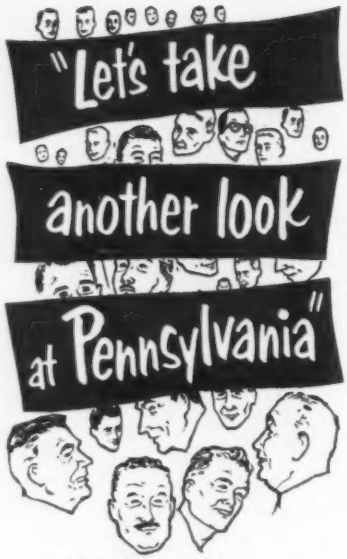

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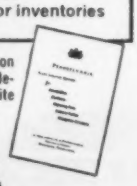

Pennsylvania Department of Commerce
South Office Building
549 State Street, Harrisburg, Pa.
Phone: CEdar 4-2912

PATENT REVIEW

New Patents In Metalworking

Ingot-Heating

Heating apparatus, J. A. Sisto and J. Milos (assigned to Barium Steel Corp., New York), Aug. 25, 1959. Instead of usual pit-soaking, ingots are supported on a number of water-cooled piers in a narrow and elongated furnace with radiant walls. No. 2,901,234.

Brazing Stainless

Nickel-chromium-germanium alloys for stainless-steel brazing, J. A. McGurty and E. S. Funston (assigned to U. S. Atomic Energy Commission), Aug. 25, 1959. An alloy for brazing stainless steel, particularly for use in high-temperature applications, comprises about 57 pct Ni, 13 pct Cr, and 30 pct Ge. No. 2,901,347.

Treating Cast Iron

Method of heat-treating cast iron, L. Saives (assigned to Regie Nationale des Usines Renault, Billancourt, France), Aug. 25, 1959. In controlled graphitization of cast iron for forming malleable pearlitic iron, the cooled casting is austenized, quenched in a salt bath, cooled to room temperature for martensitic transformation, tempered, reheated for graphitization, and cooled to room temperature. No. 2,901,386.

Dense Iron Powder

Increasing the density of iron powder by alternate rolling and grinding, S. R. Crooks and W. A. Reed (assigned to Republic Steel Corp., Cleveland), Sept. 1, 1959. Process for treating iron powder or sponge to increase bulk density and produce a material with good flow characteristics and suitable for fabrication of powdered-iron products. The powder or sponge is ground, compacted, and reground. No. 2,902,357.

Furnace Protection

Method of counteracting too-high-temperature attack on furnace lining when melting and refining molten metal with oxygen-containing gases in a rotary furnace. B. M. S. Kalling and F. K. E. Johansson (assigned to Stora Kopparbergs Bergslags Aktiebolag, Falun, Sweden), Sept. 1, 1959. In metallurgical melting and refining where an oxygen blast is used, the life of refractory linings is increased by introducing a supplemental stream of a cooling gas, such as steam or CO_2, laden with finely divided lime or iron ore, in such manner as to cut off heat radiations from the surface of the melt. No. 2,902,358.

"Patent Review" appears in the third issue of The IRON AGE each month. Look for it in the November 19 issue.

Treating Metal Powder

Method of treating powdered metal, J. M. Joyner (assigned to Farrel-Birmingham Co., Inc., Ansonia, Conn.), Sept. 1, 1959. In making iron-powder articles, 85 to 95 pct of the powder is mixed in

a bladed mixing device with 5 to 15 pct natural uncured rubber, and the mixture removed, pressed into shape, and sintered in a controlled atmosphere to decompose and drive off the rubber. No. 2,902,363.

Forming Particulates

Method of forming particulate material, A. T. Deutsch, Sept. 1, 1959. In the formation of articles of metal powders or chips, the metal is compacted, and the compact hammered in a cold state and heated. Continuation of hammering and heating causes solid diffusion at the interfaces of the particles and a reduction in volume. No. 2,902,364.

Powder Method

Process for improving parts formed by powder metallurgy by addition of spiegeleisen to metal powders, W. A. Reed and J. J. Swanson (assigned to Republic Steel Corp., Cleveland), Sept. 8, 1959. To improve tensile strength of powder-metal products, iron powder is mixed with some spiegeleisen of 17 to 21 pct Mn, 3 to 6 pct C, balance Fe, and the mixture molded and the pressed blanks sintered. No. 2,903,354.

Creep-Resistant Steel

Creep-resistant chromium steel, G. T. Harris and H. C. Child (assigned to The Birmingham Small Arms Co. Ltd., Birmingham, England), Sept. 22, 1959. A normally non-hardenable chromium steel containing at least 60 pct ferrite at 1000° to 1300°C consists of normal constituents and 0 to 6 pct Mo or W, or 0 to 2 pct V, with or without small percentages of Ti, Cb, and Ta. Creep strength is provided or improved by cold- or warm-working, or by treating by a combination of solution-hardening and precipitation-hardening. No. 2,905,577.

Copies of U. S. Patents are available at 25¢ each from Commissioner of Patents, Washington 25, D. C.

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FREE LITERATURE

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 123.

Aircraft Titanium

An illustrated 24-page engineering bulletin describes a heat-treatable titanium alloy, Ti-4A1-3Mo-1V, developed to meet the needs of high-speed aircraft. (Titanium Metals Corp. of America)

For free copy circle No. 1 on postcard, p. 123

Control Drives

A product specification describes a high-torque control drive, in four sizes, producing torques from 50 to 2250 lb-ft and suitable for high-temperature applications to 250°F. (Bailey Meter Co.)

For free copy circle No. 2 on postcard, p. 123

Vacuum Equipment

A 16-page product summary and price list classifies 600 types of vacuum-producing equipment, components, accessories, and supplies. Pumps, valves, gages, furnaces, and leak detectors are among the items included. (NRC Equipment Corp.)

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Grouting Methods

The most effective methods for grouting the different basic types of heavy industrial equipment are explained in an eight-page booklet. (The Master Builders Co.)

For free copy circle No. 4 on postcard, p. 123

Induction Heaters

A line of induction-heating equipment for hardening, brazing, soldering, forging, and annealing is covered in a 52-page catalog-handbook, which also includes some operating instructions and tips. (Induction Heating Corp.)

For free copy circle No. 5 on postcard, p. 123

When you think
of product development
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it's "tailor-made" for each job.

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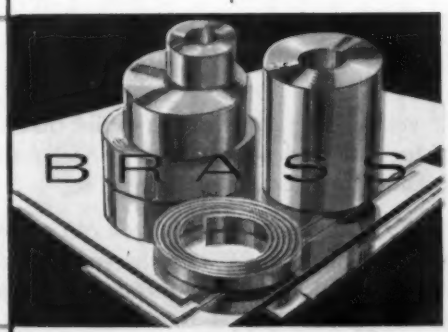

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Heavy Forklift Trucks

Features of a new series of high-capacity lift trucks designed for safe, speedy handling of loads up to 20 tons are illustrated in a new brochure. Performance, maneuverability, traction, and stability are stressed. (Hyster Co.)

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Steel Strapping

A booklet describes a line of air-power tensioners and sealers, and tells how to save time and effort and do a better, more uniform job of steel strapping. (Signode Steel Strapping Co.)

For free copy circle No. 7 on postcard

Mineral Products

A condensed catalog describes a complete line of mineral products which are widely used throughout industry. Pigments, clays, bauxites, and limestone products are included. (Minerals & Chemicals Corp. of America)

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Plunge Grinder

A four-page bulletin describes a production plunge grinder for close-tolerance work. It features the new Microfeed, an ultra-fine feed to final size. (Landis Tool Co.)

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Steel Alloy Elements

"Principal Alloying Elements in Steel" is a 16-page basic booklet intended for students. It describes carbon steel, alloy steels, and ferro-alloys. It gives information on the 12 principal alloying elements and their effects on steel properties, and lists the world sources for these elements. (U. S. Steel Corp.)

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Finishing Al, Mg

A data sheet describes processes used in the abrasive finishing of aluminum, magnesium, and their alloys. Operation data are included. (The Lea Mfg. Co.)

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Hot Topping Unit

A product bulletin describes a hot topping unit for vacuum induction melting, designed to mount on the majority of existing furnaces. It incorporates a variety of features to make operation easier and more efficient. (Zak Machine Works, Inc.)

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Snap-Action Switches

A 20-page catalog details four new series of tiny snap-action switches. (Micro Switch)

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Water Services

An illustrated 84-page book, intended for those responsible for community water service, shows how good water service benefits the community (including industry) and how inadequate service harms it. Practical information is included. (Johns-Manville)

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Chemical Products

A bulletin describes 31 industrial chemicals which a company offers for export. (Hooker Chemical Corp.)

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Socket Screws

An eight-page bulletin describes in detail the complete Unbrako line of standard socket-screw products. Included are socket-head cap screws, setscrews, button-heads, flat-heads, shoulder screws and socket-screw wrenches, as well as precision dowel pins, pressure plugs,

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FREE LITERATURE

and square-head setscrews. Very high tensile strengths are offered. A self-locking feature is available. (Standard Pressed Steel Co.)

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Load-Control Systems

A four-page bulletin discusses theory and application of tie-line load, frequency load, reactive power, and power limiting control in industrial plants, and describes strip-chart recorders and control equipment available. (General Electric Co.)

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Electrical Products

A catalog presents a complete line of electrical products, including motors, generators, coils, voltage regulators, relays, solenoid switches, and governors. (The Electric Auto-Lite Co.)

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Crane Equipment

A 12-page catalog covers a complete line of crane equipment—electric and hand-operated overhead traveling cranes, jib cranes, hand hoists, I-beam trolleys, and specially engineered crane - type equipment. (Conco Engineering Works)

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Vertical-Tube Furnaces

A bulletin provides details and illustrations of a line of standard vertical-tube furnaces for use in tensile and creep testing machines. Three maximum temperature ranges, 1850°, 2200°, and 2600°F, are available. (Hevi-Duty Electric Co.)

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Miniaturization Awards

Offered as company literature, the 1959 Miniaturization Awards Brochure describes the Miniaturization Awards Competition now in progress. An entry kit which gives all necessary information for submitting a nomination is included. (Miniature Precision Bearings, Inc.)

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Facts on Phenolics

"Facts on Phenolics," a 16-page booklet, lists the physical properties of 33 molding compounds. Many typical products are illustrated. (Hooker Chemical Corp.)

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Machine Repair

"Repair, Rebuild, or Replace?", a 4-page brochure, draws the line between repairing and rebuilding of machine tools, telling when you can get by with the one and when you need the other. It also tells which machines are worth rebuilding, and how to tell them from those that it does not pay to rebuild. Pertinent operating records and tests are discussed. (Gahr Machine Rebuilding Co.)

For free copy circle No. 23 on postcard

Self-Clinch Fasteners

A 12-page bulletin illustrates and describes a line of self-clinching inserts to provide load - carrying threads in thin steel, brass, copper, or aluminum sheets. (Penn Engineering & Mfg. Corp.)

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Brass Brightener

A data sheet covers an acidic solution used to produce a brilliant luster on lead-free wrought brass. Long-lasting, it is used at 125°F. (MacDermid Inc.)

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Smooth Tubing

A four-page bulletin describes Smoothweld steel tubing. It is made to close tolerances with exceptionally smooth surfaces, to permit joining by soldering or brazing instead of screwing or welding. Light in weight, it thus produces low-cost, "one-piece" piping systems. Its smooth interior minimizes pressure drop. (The Standard Tube Co.)

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Improve 22 Metalworking Operations with

Replacing Vapor Degreasing
to clean better, rustproof the metal, eliminate odors, skin irritations, the dangers of fire.

Rustproofing
to protect cast iron and other ferrous metals against rust for long or short periods of time.

Cleaning
to quickly clean oil, grease, soil and dirt from any metal surface from small parts to heavy machinery.

Cleaning and Rustproofing
to leave a protective rustproof surface as it cleans, so minute it cannot be seen or felt.

Magnetic Inspection
to replace kerosene or mineral spirits and safely reduce costs, speed production, improve definition.

Tumbling
to shorten the cycle, insure cleaner, rustproofed work.

Degreasing
to reduce costs, improve results, eliminate dermatitis and other hazards.

Solvent Replacement
to remove cutting oils from machined parts, at lower costs, without hazards.

Hydrostatic Testing
to give water clear, rustproof solutions.

Quenching
to prevent rusting of tank and metals quenched.

Rustproofing Internal Systems
one part to 2500 parts plain water, prevents rusting.

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to remove all surface residues in preparation for plating and as an additive to final rinses.

Honing
to aid in heat convection and release stone dust.

Cutting
to increase penetration, lower surface tension, insure cooler work, better finishes.

Grinding
to increase heat convection of coolant, wet out metallic silt and wheel dust.

Dispersing Silt
to facilitate cutting and grinding operations by dispersing and sinking metallic silt particles.

Heat Convection
to increase the convection property of plain water used for cooling, frictional heat or quenching.

Lowering Surface Tension
to insure faster penetration of liquids.

Emulsifying Fats
to carry them off and clean the receptacle.

Sealing Aluminum
after anodizing to produce a mirror-like finish, seal the pores of the metal and make it more resistant to contamination.

Write for this free booklet. It describes in detail the many outstanding results users have obtained with IMMUNOL.

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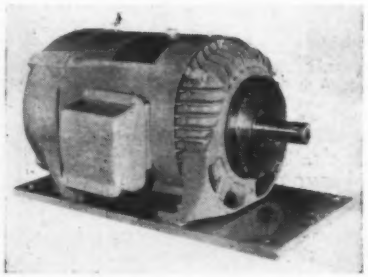
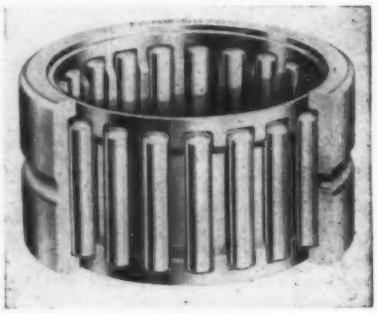


Precision Wheelhead Motor for Grinding Uses

A precision wheelhead motor for grinding-wheel applications comes in frames 213 through 256-U, totally enclosed, fan-cooled, in standard NEMA mounting dimensions. It isolates 120-cycle vibration produced in the magnetic iron, a cause of grinding blemishes. The rotor is balanced to 0.0001 in., with an external means provided for balancing. Maximum shaft runout is held to 0.00025 in. It is built with Class A insulation, 55°C rise, or Class B, 55° to 75°C rise. (Westinghouse Electric Corp.)

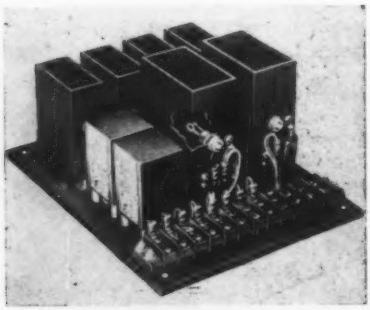
For more data circle No. 51 on postcard, p. 123



Roller Bearings Feature New Cage Design

Roller bearings with long service life, highly effective roller guidance, minimum internal friction, and generous provisions for lubrication for higher-speed operation result from a new design. Longer and larger rollers are used in a cage with depressed cage bars. Roller guidance thus takes place at the ends, and at the pitch line. Bar depressions prevent needless wiping of lubricant. Roller ends are slightly tapered to prevent stress concentration and to distribute the load uniformly. They come in sizes from ¾- to 4-in. bore. (The Torrington Co.)

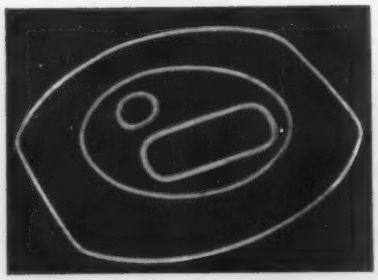
For more data circle No. 52 on postcard, p. 123



Can Replace Conventional Power Controls

Power-control units for semi-automatic or fully automatic control systems are designed to replace conventional electromagnetic power-control equipment. They are two-thirds smaller and weigh four-fifths less. Utilizing magnetic gating amplifiers driving silicon-controlled rectifiers, they come in five system types for voltage/current regulation, ac servo motor control, dc motor speed and position control, and temperature and light-dimming control. All five types come for 60- or 400-cps power, with outputs 200 to 2500 w. (Magnetic Amplifiers, Inc.)

For more data circle No. 53 on postcard, p. 123



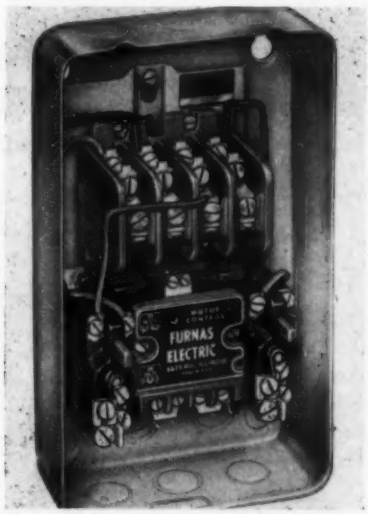
New-Design Gas Seals for Heavy-Duty Uses

Metal-tube rings pressurized with 600-psi inert gas form heavy-duty gas seals for applications involving high pressures and temperatures. They can withstand 20,000 psi and 1000°F plus. Distortion from undue compression is prevented by housing the ring in a recess of the joint. The result is a perfect static hermetic seal which will expand and contract with temperature change. For very high pressures, two or more can be used. OD's run from ½ to 96 in. (General Hermetic Sealing Corp.)

For more data circle No. 54 on postcard, p. 123

Motor Starters

Magnetic motor starters rated through 15 hp, 440/550 v, have front-removable components, dual voltage coils reconnectable on the job, and "trip-free" thermal overload relays with trip indicator. Kits are available to add pushbutton or



selector switches, pilot light, auxiliary contacts, or third overload relays. Visible contacts permit quick inspection. Magnet coils are rated 110/220 or 220/440 v, 50/60 cycles. The coil accepts a plug-in pushbutton or selector switch. (Furnas Electric Co.)

For more data circle No. 55 on postcard, p. 123

Injection-Mold Control

An electronic control unit automatically stops an injection-molding machine from applying clamping pressure when dies are not closing properly. It protects molds and reduces downtime and material waste. (Wintriss, Inc.)

For more data circle No. 56 on postcard, p. 123

Titanium Fasteners

A manufacturer offers a service for making titanium bolts, nuts, and washers to customer specifications. (Star Stainless Screw Co.)

For more data circle No. 57 on postcard, p. 123

Wear Compensator

An accessory equipped with an electrical jog button quickly and accurately compensates for polishing- and buffing-wheel wear. It eliminates former manual adjustment. Each push of the jog button lowers the work wheel a predetermined distance. (Murray-Way Corp.)

For more data circle No. 58 on postcard, p. 123

Soluble Coolant

A soluble-oil cutting and grinding coolant provides a high degree of work visibility where exceptionally fine tolerances are required. With low surface tension, high extreme-pressure characteristics, and superior wetting qualities, it provides high penetration around the cutting edge. Chip-settling capacity is very good. It is non-corrosive. (Shear-Speed Chemical Products)

For more data circle No. 59 on postcard, p. 123

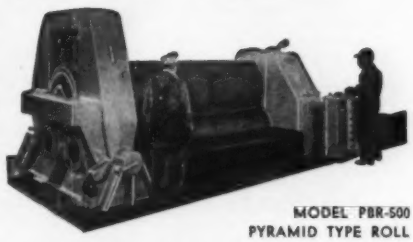
Special Tubing

Tubing in three new metals—columbium, tantalum, and vanadium—is now available in seamless grade in fully annealed, half hard

WEBB PLATE FABRICATING MACHINERY

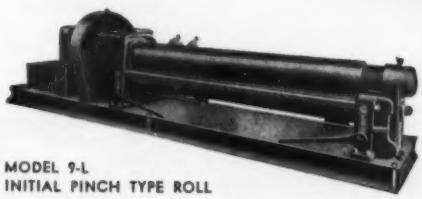
PLATE BENDING ROLLS

The Webb Corporation offers a complete line of Plate Bending Rolls for the rolling of the thinnest plate up to plate 2½" thick. Offered in a variety of lengths and thicknesses. Constructed for the modern fabricating shop.



MODEL PBR-500
PYRAMID TYPE ROLL

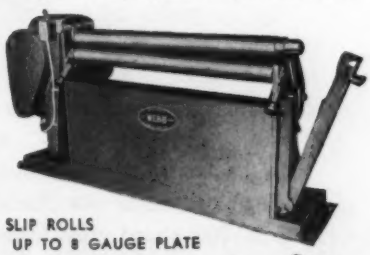
Two types available: the Initial Pinch Type and Pyramid Type machines. All latest advantages of today's modern machine tools are incorporated, utilizing anti-friction bearings, totally enclosed gear drives. Special forming rolls for culvert pipe, stock tanks and other special shapes available.



MODEL 9-L
INITIAL PINCH TYPE ROLL

SLIP ROLLS

A complete line of small Sheet Metal Forming Rolls are also available. All power-driven with shaft sizes 3" to 5" for the handling of the thinnest gauge material, up to 8 gauge material. Special rolls for the forming of polished sheets, aluminum and stainless steels can be furnished. Complete catalogues on any size machine furnished upon request; write Dept. E.



SLIP ROLLS
UP TO 8 GAUGE PLATE

Let Speed PAY—The WEBB Way!

SLIP ROLLS

PYRAMID TYPE ROLL

INITIAL TYPE ROLL

STEELWORKERS

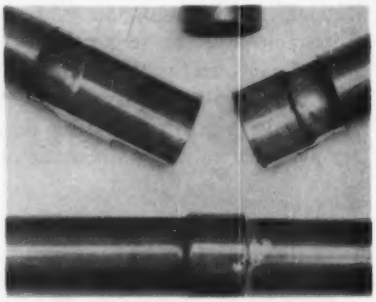
Since 1881 THE WEBB® CORP.
WEBB CITY, MO., U. S. A.

drawn, and full hard tempers, in sizes from 0.012 to 1.125 in. OD. (Superior Tube Co.)

For more data circle No. 60 on postcard, p. 123

Smooth Tubing

Tubing brand-named "Smoothweld" is designed for piping fluids where corrosion is not a factor, to improve on screwed and welded piping commonly used. It is soldered or silver brazed without using couplings. One end of each length is expanded for mating. Mating ID's and OD's are held to close tolerances. Connections are easy to make in confined areas because heat and solder need be applied to only a single point of the joint. Also, fewer connections are required, since directional changes are made with bends. Electric resistance welded from flat rolled steel, it costs less per foot installed than black pipe, weighs less, and

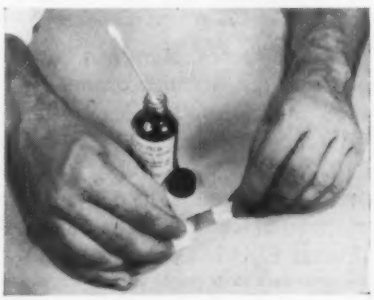


has a smaller OD. (The Standard Tube Co.)

For more data circle No. 61 on postcard, p. 123

Teflon Bonding Agent

A liquid simplifies bonding of Teflon to itself and other materials. An activated form of sodium in solution, it reacts with Teflon to form a carbonaceous film which serves as a means of anchoring ad-

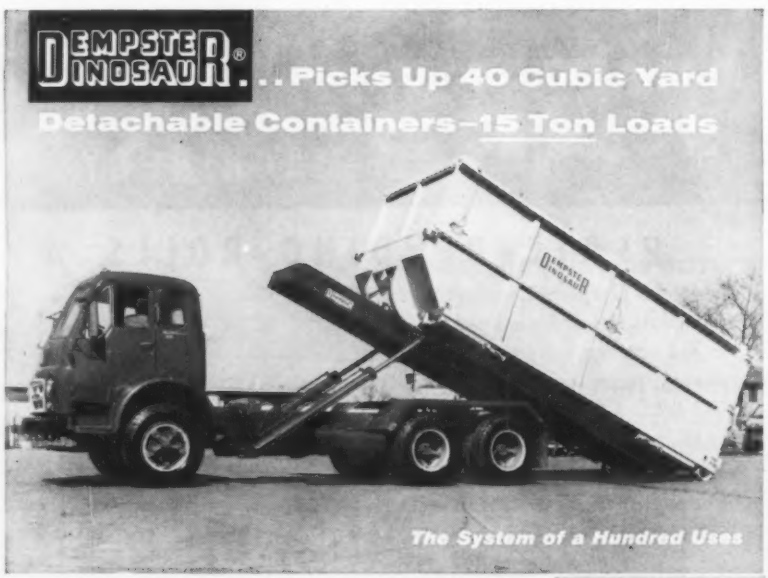


hesives to the Teflon. It is compatible with most adhesives and is easy to use and fast-working. It can be used successfully in production-line work. (W. L. Gore & Associates, Inc.)

For more data circle No. 62 on postcard, p. 123

NEW BOOK

"The Communist World as Customer and Competitor" is timely in view of Russia's drive to broaden East-West trade. One section shows the relation of exports to the Soviet internal economy and lists exports and imports by countries. U. S. trade controls are described, and there is a chapter on Russia's trade-aid drive. 30 pp. $36 per copy. Business International, 200 Fourth Ave., New York 3.



Here's the detachable container system of a hundred uses. The simple, powerful, one-man DEMPSTER-DINOSAUR automatically picks-up . . . hauls . . . dumps . . . puts down . . . or pushes off on dock, loads limited only by the size of the truck or by highway restrictions. All handling operations are performed without the driver leaving the cab . . . no cables to hook on . . . no chains . . . . . . sheaves . . . winches. Models available for single or tandem axle chassis . . . 22,000 to 30,000 pound gross loads. Containers, six to 40 cu. yds. and over, available for refuse, scrap, materials handling, cargo, "boxy-back" rail shipments and many other uses. Write today for brochure or for a demonstration in your city.

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This is because Crucible precision-rolls stainless to produce finishes of incomparable lustre. Not only that, Crucible methodically checks each heat to ensure uniform physical properties and accurately controls gauge with electronic measuring devices. For stainless in all gauges down to .010" and in all strip widths, call or write: Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.

CRUCIBLE STEEL COMPANY OF AMERICA

CANADIAN DISTRIBUTOR — RAILWAY AND POWER ENGINEERING CORP., LTD.

Physical tests at Standard include those for special properties of steel alloys under extreme variations in temperature. Here, the strength and ductility of steel are being checked for resistance to stress under severe conditions of elevated temperatures over a prolonged period of time.

Charpy impact and transition temperature determinations have recently assumed importance in many applications. Here a steel sample is immersed in liquid nitrogen to determine its susceptibility to fracture at temperatures as low as —300°F.

Quality control—a vital activity at Standard Steel Works

Every conceivable shop and laboratory test required for modern quality control can be performed by Standard's staff of metallurgical technicians. Testing of incoming raw materials; physical property tests of steel and other alloys at temperatures from several hundred degrees below zero up to red heat; gas analysis, ultrasonic, X ray, magnetic particle, fluorescent penetrant and microscopic examination of finished products are routine checks which assure that the finished, delivered product will meet the most rigid specifications. Write Department I-J for full details.

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BALDWIN · LIMA · HAMILTON

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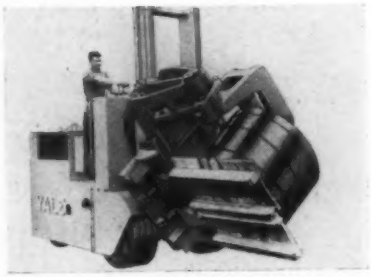
Rings • Shafts • Car wheels • Gear blanks • Flanges • Special shapes

New Equipment and Machinery

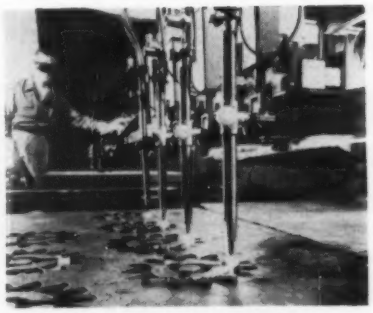
Upender on Truck Simplifies Coil Handling



For heavy-duty electric trucks, an upending and rotating ram and fork attachment simplifies handling of coils flat on pallets or upright. Capacity runs from 15,000 to 20,000 lb. A pair of rotating forks, a pivoting ram, and independent sideshifting or either ram or forks enable six different movements. An operator can handle and stack coils, rotate and upend them, remove them from pallets and turn them to put them on mandrels, and handle and stack palletized coils. (The Yale & Towne Mfg. Co.)

For more data circle No. 71 on postcard, p. 123

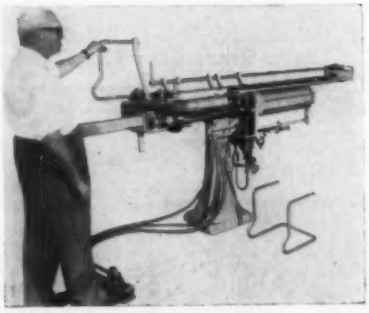
Tracing Shape Cutter Works Within 8-ft Width



A pantograph-type machine does straight-line or shape cutting anywhere within an 8-ft width and an indefinite length. It carries up to four motorized torches using acetylene, propane, or natural gas. The gas-distribution system has the capacity to supply four torches cutting 12-in. material simultaneously. All operator controls are centralized. The movement, on a folding arm, of the tracing device following a template is transmitted mechanically to the torch bar, which is mounted likewise. Right- or left-hand operation is available. (Air Reduction Co.)

For more data circle No. 72 on postcard, p. 123

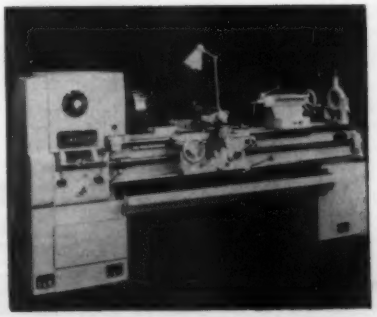
Bending Machine Features Automatic Indexing



Powered by air compression, a low-cost, compact precision bender is simple to operate and makes over 900 bends per hour. An automatic indexing unit handles up to six different shaped bends on one piece, on up to 1⅛-in.-OD tubing. There is no resetting of stops after each bend; now all settings are made beforehand to allow continuous operation. The indexer is actuated for the next bend on return stroke of the bending cylinder. A movable foot pedal permits the operator to run the machine from any position. (Paul Machine Tool & Die Works)

For more data circle No. 73 on postcard, p. 123

Hydraulic Controls Speed Lathe Operation



Available at low cost, a new line of lathes features rapid hydraulic power shifting of spindle speeds. The operator need only rotate a dial for fast speed changes. Speeds to 3000 rpm and a wide, heavy compound and cross-slide team to enable heavy, high-speed cuts and allow full use of carbide and ceramic tooling. Very rapid tailstock positioning is possible with a single "quick-clamp" lever. These lathes come in swing sizes of 10, 12½, 15, and 18 in. The larger two are adaptable to a hydraulic tracer control of the same make. (Cincinnati Lathe and Tool Co.)

For more data circle No. 74 on postcard, p. 123

NEW EQUIPMENT

Barrel Dumper

A portable barrel and drum elevating and dumping unit is designed to elevate drums of machine parts and dump them into work surfaces. With 2000-lb capacity, it has electric drive with automatic and inching control. A chain is tightened around the barrel or drum on the floor, which is then raised and tipped horizontal to unload parts. It is also useful for handling containers of acids, oils, and other chemicals and supplies. It is caster-mounted and has a floor lock to prevent travel when dumping. (Jarke Mfg. Co.)

For more data circle No. 75 on postcard, p. 123

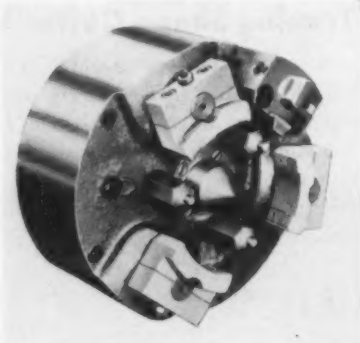
Splined Mill Cutters

Splined milling cutters and arbors increase both cutter life and metal-removal rates from 100 to 400 pct. They are especially valuable in machining hardened high-strength alloys. Arbors, spacers, and cutters are all splined to resist torsional deflection, reducing backlash and virtually eliminating the chatter that shatters carbide tips. Very fast cutting is possible. Splined arbors, with 50-mm taper, are made in 1, 1¼, 1½, and 2-in. diam, in standard lengths, specials on order. (Pratt & Whitney Co., Inc.)

For more data circle No. 76 on postcard, p. 123

New Chuck Design

Ball-joint actuation replaces the conventional T-slot design in a new power chuck. This design affords pull-back action against fixed work stops, resulting in greater accuracy and rigidity in chucking parts. A 5-to-1 linkage ratio generates tremendous gripping power. Jaw segments are reversible, and interchangeable, and can be serrated or furnished with inserts. Sizes of 10, 12, 15, and 18 in. are available, with specials on request. (N. A. Woodworth Co.)



For more data circle No. 77 on postcard, p. 123

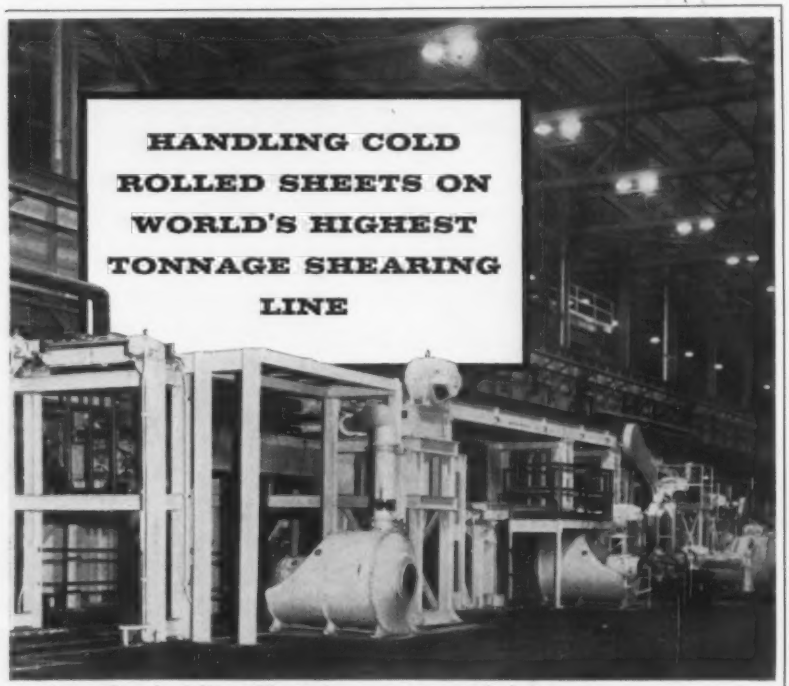
Side-Shift Load Grab

A new side-shift load grab uses fork arms that can be set horizontal to operate like a normal forklift, or vertical to grip all sorts of loads from the sides and position them exactly. (Lewis-Shepard Products, Inc.)

For more data circle No. 78 on postcard, p. 123

Radius Turner

A radius-turning attachment has a 3⅝-in. capacity, and will ma-



Aetna-Standard Sheet Piler at large eastern steel plant.

SPENCER Blowers "Float" Sheets into Piler Bin

ALSO MANUFACTURERS OF

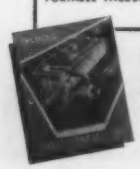
PNEUMATIC CONVEYING SYSTEMS

INSTALLED VACUUM SYSTEMS

PORTABLE VACUUM CLEANERS

An air "cushion" created by the Spencer blowers permits sheared sheets to "float" down into position . . . reduces surface scratching and speeds production.

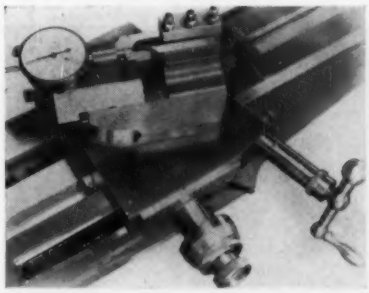
Whatever your requirements in dependable air delivery . . . whether for special applications like this or for standard needs in supplying combustion air . . . it will pay to check with SPENCER—first in service to the metalworking industry since 1918.



Request Catalog 126C containing complete information on Spencer blowers.

The SPENCER TURBINE COMPANY
HARTFORD 6, CONNECTICUT

chine concave or convex surfaces on the axis of the lathe with a single-point turning tool. The tool bit is set to the desired radius by taking the reading on a thousandth-



reading dial indicator. Feed is by worm and worm gear for positive, even control. (The Wade Tool Co.)

For more data circle No. 79 on postcard, p. 123

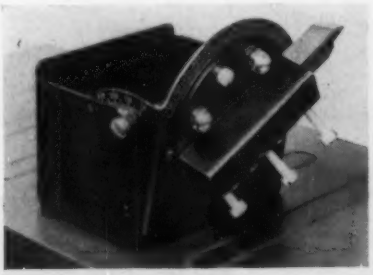
Stock Straighteners

A new line of stock straighteners is available in six models. They handle coiled stock 4 to 10 in. wide and 0.020 to ⅛ in. thick. Speed control is variable to match automatic feed of the press with which the machine is used. In addition to removing coil set, they can be used to straighten blanked parts or to deburr shear-slit stock. (H. E. Dickerman Mfg. Co.)

For more data circle No. 80 on postcard, p. 123

Grinding Fixture

A low-cost tool-bit grinding fixture of sturdy pressed-steel construction has a precision-ground master surface. It quickly sets up for any combination of rake and clearance angles and grinds all



sides in one setting. It holds any single-point tool such as threading tools, box tools, boring tools, and lathe tools. Tool-bit capacity is ½ x 2¼ in. (Montgomery & Co., Inc.)

For more data circle No. 81 on postcard, p. 123

STEEL WAREHOUSE "TAKES TO THE AIR"

Fig. 1 — TRAK-RAK fork lift at top of column, lifting bundle of steel rod. Unit serves 3 long aisles of racks.

TRAK-RAK SYSTEM INCREASES STORAGE SPACE, SAVES 22% CAPITAL BUILDING INVESTMENT

When A. C. Leslie & Co. Limited, needed more storage area in its busy Toronto steel warehouse, it decided to "reach for the ceiling" with a Chicago Tramrail TRAK-RAK System of vertical storage and handling. As a result, the company estimates it not only saved 22% of projected capital building costs, but increased the overall efficiency and speed of the Toronto operation. The company expects to gain further economies as the TRAK-RAK system is used to its full extent.

A 5 ton capacity toprunning TRAK-RAK Crane was installed in each of two 40 ft. wide bays to serve specially designed 18 ft. high material storage racks (Fig. 1). Each crane bridge has an overhead trolley, from which is suspended an electrically operated rotating column

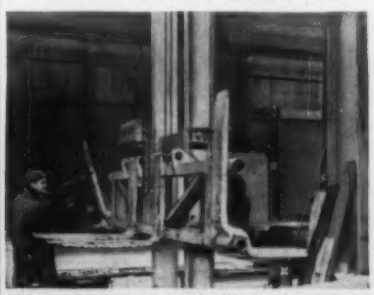


Fig. 2 — Carriage equipped with 2 pairs of forks. Operator is flopping outer forks up.

equipped with a special fork lift. All operations of the fork lift, which revolves to serve either side of the aisles, moves toward or away from the racks, and raises or lowers on the column, are controlled by the operator who rides with the carriage.

Two pairs of forks are mounted on the carriage. The outer forks may be flopped back (Fig. 2) leaving the inside forks in position for handling palletized or crated material. For handling long boxes, bars, etc., the outside forks are flipped back into working position.

A TRAK-RAK feature which added to handling speed and insured safe operation was the safety interlock switch system which prevents the column from running

Fig. 3 — TRAK-RAK column requires minimum aisle space for operation.

into a rack and permits full rotation only when the unit is safely beyond the end of the racks.

The A. C. Leslie Company reports that a similar TRAK-RAK System installed in its Montreal warehouse permitted a 37% savings in capital building investment with equally good operating efficiency and economy.

For complete details on the TRAK-RAK System of vertical storage and handling, write the manufacturer:

CHICAGO TRAMRAIL CORPORATION
1312 S. Kostner Avenue • Chicago 23, Ill.

Now the nation's third largest steel plate producer

Left to right: George Copeland, Manager of Lukens' newly consolidated Sales Service Division, with department heads Arthur Powers of Customer Service, and Richard Slider of Order Processing.

LUKENS STREAMLINES ITS CUSTOMER SERVICES

The demanding process of making quality steel plate can't be rushed. But Lukens *has* cut the time it takes to process your orders and answer service inquiries.

In our *Customer Service Dept.*, for example, quotations, order status information, and similar requests are now handled by five area supervisors, each with a specific geographic territory to serve. All five are located in Coatesville. They and their staff members are ready to supply detailed information on any and all Lukens products —*promptly* through our sales offices.

Result: shortened lines of communication . . . faster action . . . greater customer satisfaction.

Equally important, our *Order Processing Dept.* has also been re-shaped. This one department now handles all orders for Lukens' full range of plate and fabricated products.

Streamlining our entire service organization was a logical complement to Lukens' "Phase A" expansion objectives: *new capacity and quality levels to meet the growing needs of our plate fabricating customers.*

Lukens Steel Company, Coatesville, Pa.

NEW CAPACITY ~ NEW QUALITY

LUKENS ®

SERVING INDUSTRY WITH A WIDE RANGE OF SPECIALTY CARBON, ALLOY, ARMOR AND CLAD STEEL PLATE • HEADS • PLATE SHAPES • PLATE-MATE WELDING ELECTRODES AND WIRE

The Iron Age Summary

T-H Can't Prevent Market Chaos

BULLETIN: David McDonald, Steelworkers president, made a bold personal bid early this week for support from the steel-hungry auto industry.

He told top General Motors officials that, with their support, the steel strike could be ended within a few days.

▪ Invoking the Taft-Hartley Act can not prevent complete chaos in the steel market. President Eisenhower's move provides time for another try at settlement. But the delaying action takes the country closer to the worst steel shortage crisis in its history.

If the injunction is ordered, it can at best prevent the nation's steel users from running completely out of steel. But it will be too late to avoid widespread layoffs.

Only 50 Days—The 80-day back-to-work provision of T-H actually would result in only about 50 days of full steel production. This is because of time needed to start up ingot production and to fill the mill's own pipelines.

In addition, no one in the industry or the Steelworkers union is under any illusions that the workers will put out full effort. The union opposes the injunction, believes it will only ease pressure from steel users for a quick settlement.

7 Million Tons of Steel—Total steel stocks in the U. S. are about 7 million tons. This is unbalanced inventory; some of it is obsolete; and much of it must be put into balance by new shipments.

The steel crisis, which is outwardly evident now, was really reached four weeks ago when severe steel shortages and a resulting spread of layoffs and cutbacks became inevitable.

Future Effects—These developments are expected in the steel market:

Steel shipments will not reach top volume until from four to six weeks after the workers go back.

Some items will be in short supply and on allocation through the first half of 1960. Some products will stay tight even longer.

The iron ore crisis will hit mills in January and February. Some mills will fail to maintain full output because of the shortage. The ore crisis is one of the principal reasons for the President's invoking T-H, but the delaying action will only add to the ore crisis.

Scrap prices will soar as mills fight the ore shortage with larger charges of scrap. Turnings, for years a drug on the scrap market, will be in great demand to boost blast furnace output.

Users Hit Hard—On the user side, automakers are hardest hit of the big steel consumers. Shortages will prevent the auto industry from reaching its ambitious production goals in the next few months.

As a secondary effect, this will take its toll of steel available for other industries. The auto industry normally takes from 15 to 20 pct of all steel output. But in the late fall and winter production surge, automakers will try to grab off 25 to 30 pct of available steel.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	353	368	353	2,011
Ingot Index				
(1947-1949=100)	22.0	22.9	22.0	125.2
Operating Rates				
Chicago	5.0	5.0	5.0	85.0
Pittsburgh	4.0	4.0	3.0	68.0
Philadelphia	12.0	12.0	12.0	77.0
Valley	10.0	10.0	10.0	57.0
West	0.0	0.0	0.0	74.5
Cleveland	0.0	0.0	0.0	79.0
Detroit	26.0	26.0	24.0	79.0
Buffalo	0.0	0.0	0.0	78.0
South Ohio River	73.0	70.0*	68.0	81.0
South	12.0	12.0	12.0	66.0
Upper Ohio River	55.5	57.0	51.0	82.0
St. Louis	89.0	91.0*	97.0	101.0
Aggregate	12.5	13.0	12.5	74.5

*Revised

Prices At a Glance

(Cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel base	6.196	6.196	6.196	6.196
Pig Iron (gross ton)	$66.41	$66.41	$66.41	$66.49
Scrap No. 1 hvy (Gross ton)	$44.50	$43.50	$41.50	$42.50
No. 2 bundles	$30.17	$29.83	$28.00	$28.50
Nonferrous				
Aluminum ingot	26.80	26.80	26.80	26.80
Copper, electrolytic	30-31.5	30-31.5	30-31.50	27.50
Lead, St. Louis	12.80	12.80	12.80	12.30
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	102.125	103.50	102.50	95.625
Zinc, E. St. Louis	12.00	12.00	11.00	11.00

Steel Buyers Must Plan Ahead

Outlook for steel warehouses is that steel will be tight for some time after the strike is settled.

A leading buyer says purchasing agents look ahead to keep supplies up.

■ "The big job of the steel buyer now is to consolidate his position with established suppliers," says Louis Siegel, purchasing agent for Levinson Steel Co., Pittsburgh.

Mr. Siegel sees steel supply headed for the worst pinch since after Korea. "It's evident," he says, "that all steel products will go on allotment for at least three months after the strike and probably for six months."

Unique View—Louis Siegel has a unique view of the steel picture. He buys mill products for one of the largest independent warehouses in the country. Levinson specializes in plates and structurals, carries a full line of bars and sheets. The company has structural fabricating capacity of 25,000 tons a year.

In times like these, the dual supply operation becomes closely identified with sales. For a warehouse to sell steel, it must find steel. This need has drawn Mr. Siegel into a nationwide swapping operation, filling in inventory holes for one fabricator and buying up the excess of another.

Material Available — "It's surprising how much excess material is available" he says. "Inventories are so unbalanced that fabricators are selling either because they have too much of one product or because a critical shortage has forced a complete shutdown."

LOUIS SIEGEL: "Steel buyers must consolidate position with suppliers."

However, he feels the supply of spot surplus is dwindling fast. Regular warehouse stocks are scraping bottom; Mr. Seigel estimates the pre-strike accumulation is at least half gone. Levinson finds itself with dwindling supplies of wide flange beams, plates under 1 inch and all sheet products. To meet the needs by making substitutions with thinned-out stocks takes an average of 500 tons to fabricate a 100-ton job.

In this situation, says Mr. Siegel, many fabricators have just given up trying. Premium and imported steels are no answer for tonnage requirements. Mr. Siegel says grey market steel is running $20 to $40 a ton over warehouse levels. For spot delivery of foreign steel, prices are now $30 to $40 over mill schedules on wide flange beams and $10 to $20 on standard structurals.

Foreign Prices—Prices on foreign futures are $20 to $30 over mill price for wide flange beams. Standard structurals for future delivery are selling at about the domestic price. The best delivery you can get on a future order is January.

Mr. Siegel points out that even if a plant is willing to pay higher prices, there is not enough foreign production to meet needs. As an example there are only two or three mills in Europe that roll wide flange beams.

Outlook Dim—This means warehouses and fabricators will have to rely on domestic mills for most of their needs. Mr. Siegel feels the outlook on mill deliveries after the strike is not cheerful. Levinson got about 25 pct of its July tonnage before the strike. Part of the remaining 75 pct is close to the shipping stage and delivery is expected 10 to 14 days after the strike.

when you've got a technical product, sell it!

Your product represents an investment in technical know-how, aimed at solving your customer's problem. Too often this is overlooked. Price and availability are depended upon to make the sale.

By the time your sales force arrives at the scene, several decisions have already been made by the technical man *who cares what happens to metals.* This problem-solver, whom we call the "metals engineer," plays a critical part, regardless of title, wherever metals are produced, fabricated, tested and applied.

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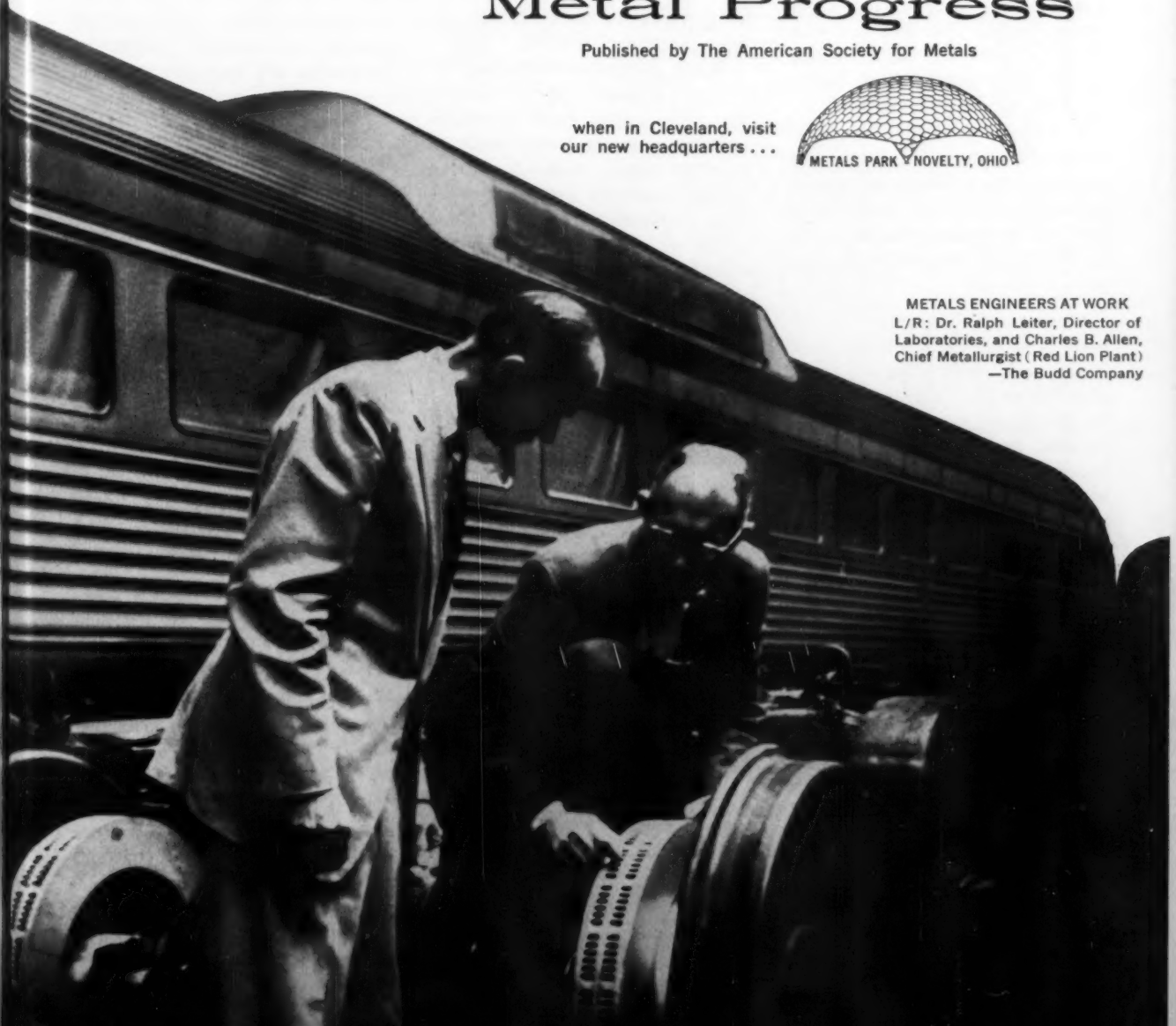

METALS ENGINEERS AT WORK
L/R: Dr. Ralph Leiter, Director of Laboratories, and Charles B. Allen, Chief Metallurgist (Red Lion Plant)
—The Budd Company

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Steel Users Face Rough First Half

Shortages and quota restrictions will bother steel users long after strike ends.

Mills are booked many months into the future on some products.

■ Steel users face a rough six months in the first half of 1960. Many products will be in limited supply. Some will be doled out by the mills on a strict quota basis.

Use of a Taft-Hartley injunction or a strike settlement won't ease these problems. Users are starved for steel. The mills have heavy backlogs. Inventory rebuilding will go on beyond the middle of next year.

Preview of Trouble — Current troubles of the mills still operating give a clue about what to expect after the strike. These mills, rushing to get as much steel out as possible, find it difficult to reduce backlogs. Order books are filled beyond the end of the year. Regular customers are on an allotment basis for sheet, plate, and bar products.

Among the struck mills, order books are filled out four, five, or six months beyond the strike. New business, when formally accepted, is stamped for delivery X number of weeks ARO—after resumption of operations.

Sheet Tightest—Sheet products, especially cold-rolled and galvanized are the most critical. A booming market is assured for the first six months after the strike.

Plate is about as tight with light plate in greater demand than heavier plate at the moment. Structural bookings are a little slower because fabricators are holding up on some construction jobs. After the strike is settled, this pace will pick up.

Other Backlogs—Backlogs at bar mills extend from four to six months after operations resume. Cold finishers expect to set up quotas for users in the first quarter.

Other products — including oil country seamless pipe, buttweld pipe, rails, some types of manufacturers wire, and strip—will be in better supply in the post-strike period. But even for these items "ease of supply" is relative. Some grades of wire, for example, are available for "prompt delivery"—about 90 days after operations start up.

Conversion Steel—Buyers continue trying to line up ingots or billets for rolling elsewhere. In many cases conversion deals fall through because mills with semi-finished steel don't want to sell it. In addition, there are few non-struck mills which have excess rolling space even if the steel is obtained. This situation will not improve even when full industry operations resume. Some sheet mills, running ahead of steelmaking capacity, are buying ingots from other producers.

One mill now struck, the Claymont, Del., plant of Colorado Fuel & Iron Corp., says it will sell ingots for conversion when operations resume.

Sheet and Strip — Users expect mills will keep them on a rigid quota basis for most of the first half. Small-tonnage buyers are concerned about the demands appliance and auto companies will make on steel mills for post-strike delivery. Some estimate they have lost up to six months worth of 1959 cold-rolled sheet shipments because of the strike. Second quarter deliveries were reduced because of mill carryovers. Strike shutdowns cost another three months' production. And mills still operating have cut user quotas in the third quarter.

Shapes and Plates—Shortages are forcing customers to make substitutions, pay premium prices, or buy foreign steel. In the **Chicago** area, structurals are being fabricated from plate to fill small tonnages on urgently needed orders. An **Eastern** contractor went all the way to Michigan to get Swedish structurals brought in on the Seaway. Sales agents for foreign mills are offering plate (including the light gages) for delivery next month. But the steel is priced at warehouse levels and quantity orders are wanted. In some cases the sales also depend on whether the user will agree to take additional tonnages next year.

Service Centers—Midwest warehouses are cleaned out on light plate. Some heavy plate remains, but only because fabricators usually don't want to pay warehouse prices. An **East Coast** service center admits sheet supplies are exhausted, says stocks of shapes, bar, and light plate are very low.

Bar—Hot-rolled bar users are placing orders for the fourth and fifth month after the strike. Mills are not encouraging customers to send in orders, but more long-range business keeps arriving.

PURCHASING AGENT'S CHECKLIST

Government turns to closed circuit TV for auction of surplus goods. P. 64

Curtain wall fabricators cash in on rising market in industrial building. P. 66

New process bonds plastic coating to continuous coils of strip steel. P. 101

COMPARISON OF PRICES

(Effective Oct. 13, 1959)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	Oct. 13 1959	Oct. 6 1959	Sept. 15 1959	Oct. 14 1958
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	13.55	13.55	13.55	13.55
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.30
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.00
Special coated mfg. ternes	9.90	9.90	9.90	9.55
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	45.00
Wrought iron bars	14.90	14.90	14.90	14.90
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 100 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	Oct. 13 1959	Oct. 6 1959	Sept. 15 1959	Oct. 14 1958
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.57	$70.57	$70.57	$70.57
Foundry, Southern Cin'ti	73.87	73.87	73.87	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.07
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	$66.41	$66.41	$66.41	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$46.50*	$45.50	$43.50	$44.50
No. 1 steel, Phila. area	44.50*	43.50	40.50	40.50
No. 1 steel, Chicago	42.50*	41.50	40.50	42.50
No. 1 bundles, Detroit	39.50	39.50	39.50	35.50
Low phos., Youngstown	47.50*	46.50	45.50	45.50
No. 1 mach'y cast, Pittsburgh	53.50	53.50	53.50	51.50
No. 1 mach'y cast, Phila.	53.50	53.50	52.50	49.50
No. 1 mach'y cast, Chicago	63.50	63.50	61.50	53.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$44.50*	$43.50	$41.50	$42.50
No. 2 bundles	30.17*	29.83	28.00	28.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.50-15.50	$14.50-15.50	$14.50-15.50	14.50
Foundry coke, prompt	18.50	18.50	18.50	18-18.50
Nonferrous Metals: (cent per pound to large buyers)				
Copper, electrolytic, Conn.	30-31.50	30-31.50	30-31.50	27.50
Copper, Lake, Conn.	31.50	31.50	31.50	27.50
Tin, Straits, N. Y.	102.125†	103.50	102.50	95.625
Zinc, East St. Louis	12.00	12.00	11.00	11.00
Lead, St. Louis	12.80	12.80	12.80	12.30
Aluminum, virgin ingot	26.80	26.80	26.80	26.80
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. ** Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composites

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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Optimism Mounts On T-H Prospects

The possibility of mills reopening under a Taft-Hartley injunction has caused the trade to become even more bullish.

Scrap traders feel that sizeable mill orders will force price up.

▪ The pace of trading hasn't picked up much. But prices continue to increase. The trade has become more bullish as prospects improve for mills reopening under a Taft-Hartley injunction.

The feeling is that mills will have to buy soon, and will have to pay higher prices to get delivery. Generation of industrial scrap has fallen sharply in the past several weeks.

Stamping plants and machine shops have curtailed operations due to shortages of steel. It isn't likely this situation will be remedied quickly no matter how soon steel mills resume operations.

Pittsburgh—Prices of openhearth grades moved up $1 this week, reflecting the strength shown by industrial lists. Higher prices paid in nearby districts and the bullish sentiment of local suppliers also affected the market. There is still no important new buying by district consumers and there is no guarantee when orders will be placed. However, the feeling of scrap men is that mills will have to buy soon and will have to pay higher prices to get delivery. Scrap men say industrial accumulations are virtually all committed.

Chicago—The market has held steady in many grades. Trading moves at a very slow pace. A few tentative mill offers at existing price levels has failed to move scrap. Dealers continue to build yard stocks in anticipation of a strong, late fall market. Small purchases of scrap for laydown, and by out-of-area mills, are reported to continue. RR steel car axles were incorrectly reported at $61 to $62 last week. The correct price should have been $59 to $60.

Philadelphia—Export activity resumes this week as dock workers return to work under Taft-Hartley injunction. The market is very strong as the trade expects similar action in the steel strike. Turnings are very firm at quoted prices and any tonnage orders would undoubtedly force prices up.

New York — A combination of holidays virtually chloroformed this market late last week and early this week. Prices are unchanged. But brokers and dealers expect rapid price increases when mills reopen. They point to an expected shortage of hot metal and future ore shortages.

Detroit—Feeling is the market will strengthen if T-H is invoked. There will be more mills open for shipment—more customers mean more action. One broker sees T-H creating a "fairly bullish" market for about 60 days. Currently, there is still plenty of dealer scrap around. A little tonnage is being shipped to working mills.

Cleveland — Market is growing more bullish with the end of the strike in sight. Electric furnace grades are in special demand in the Valley and nearby areas. Busheling is $1 over dealer bundles and heavy melting steel because it will go into electric furnaces. A Valley mill bought high-grade low phos plate for $49 and a local foundry bought 2-ft foundry steel for $42 plus $1 springboard, but in limited tonnages.

St. Louis—Since scrap prices have reached higher levels recently, movement in this area is a little better. However, dealers are holding on to most of their scrap. They're trying to build inventories and feel they can't lose. They believe prices have to go higher so why sell now when, in the very near future, they can get more.

Cincinnati — Underlying market strength remains, although operating mills are not reaching for scrap. Upriver market is fairly strong and local dealers can sell there to get rent money.

Birmingham — An Atlanta mill bought a fairly large tonnage of No. 2 heavy melting scrap, paying $2 per ton more than last month. A large Birmingham electric furnace filled its October needs at unchanged prices. An Alabama mill now closed by the strike is buying No. 2 bundles for delivery after the strike ends. Movement of foundry and cast grades increased slightly this week. Export is strong.

Buffalo—Business is at a standstill here, but dealer optimism continues high in the face of T-H action. Prices of most grades are up $1 on appraisal.

Boston—With the dock strike at least temporarily over, export has resumed and the market continues firm. There are no price changes in the steady market.

West Coast—Most dealers look for price rise. Market for steelmaking grades continues strong. There's little demand for No. 2 bundles. Mills are stockpiling scrap.

Houston — Although the dock strike is over, exporters are slow to resume activity. A wait-and-see attitude prevails in the market. Cast market is holding steady.

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JENKINTOWN 17, PENNSYLVANIA

SCRAP PRICES *(Effective Oct. 13, 1959)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$46.00 to $47.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	47.00 to 48.00
No. 1 factory bundles	52.00 to 53.00
No. 2 bundles	32.00 to 33.00
No. 1 busheling	46.00 to 47.00
Machine shop turn.	22.00 to 23.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	28.00 to 29.00
Low phos. punch'gs plate	51.00 to 52.00
Heavy turnings	36.00 to 37.00
No. 1 RR. hvy. melting	48.00 to 49.00
Scrap rails, random lgth.	58.00 to 59.00
Rails 2 ft and under	62.00 to 63.00
RR specialties	56.00 to 57.00
No. 1 machinery cast.	53.00 to 54.00
Cupola cast.	49.00 to 50.00
Heavy breakable cast.	47.00 to 48.00
Stainless	
18-8 bundles and solids	235.00 to 240.00
18-8 turnings	115.00 to 120.00
430 bundles and solids	130.00 to 135.00
410 turnings	55.00 to 60.00

Chicago

No. 1 hvy. melting	$42.00 to $43.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 dealer bundles	42.00 to 43.00
No. 1 factory bundles	48.00 to 49.00
No. 2 bundles	29.00 to 30.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	22.00 to 23.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	24.00 to 25.00
Low phos. forge crops	57.00 to 58.00
Low phos. punch'gs plate, ¼ in. and heavier	53.00 to 54.00
Low phos. 2 ft and under	51.00 to 52.00
No. 1 RR hvy. melting	48.00 to 49.00
Scrap rails, random lgth.	58.00 to 59.00
Rerolling rails	66.00 to 67.00
Rails 2 ft and under	62.00 to 63.00
Angles and splice bars	57.00 to 58.00
RR steel car axles	59.00 to 60.00
RR couplers and knuckles	54.00 to 55.00
No. 1 machinery cast.	63.00 to 64.00
Cupola cast.	56.00 to 57.00
Cast iron wheels	50.00 to 51.00
Malleable	64.00 to 65.00
Stove plate	52.00 to 53.00
Steel car wheels	53.00 to 54.00
Stainless	
18-8 bundles and solids	220.00 to 225.00
18-8 turnings	120.00 to 125.00
430 bundles and solids	120.00 to 125.00
430 turnings	60.00 to 65.00

Philadelphia Area

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 dealer bundles	46.00 to 47.00
No. 2 bundles	28.00 to 29.00
No. 1 busheling	46.00 to 47.00
Machine shop turn.	23.00 to 24.00
Mixed bor. short turn.	22.00 to 23.00
Cast iron borings	21.00 to 22.00
Shoveling turnings	26.00 to 27.00
Clean cast. chem. borings	30.00 to 31.00
Low phos. 5 ft and under	47.00 to 48.00
Low phos. 2 ft punch'gs	49.00 to 50.00
Elec. furnace bundles	47.00 to 48.00
Heavy turnings	34.00 to 35.00
RR specialties	47.00 to 48.00
Rails 18 in. and under	63.00 to 64.00
Cupola cast.	44.00 to 45.00
Heavy breakable cast.	47.00 to 48.00
Cast iron car wheels	47.00 to 48.00
Malleable	67.00 to 68.00
No. 1 machinery cast.	53.00 to 54.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$35.50 to $36.50
No. 2 hvy. melting	30.50 to 31.50
No. 1 dealer bundles	35.50 to 36.50
No. 2 bundles	25.00 to 26.00
Machine shop turn.	17.00 to 18.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	18.00 to 19.00
Low phos. 18 in. and under	47.00 to 48.00
Rails, random length	50.00 to 51.00
Rails, 18 in. and under	58.00 to 59.00
No. 1 cupola cast.	47.00 to 48.00
Hvy. breakable cast.	43.00 to 44.00
Drop broken cast.	57.00 to 58.00

Youngstown

No. 1 hvy. melting	$45.00 to $46.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 dealer bundles	45.00 to 46.00
No. 2 bundles	28.50 to 29.50
Machine shop turn.	19.50 to 20.50
Shoveling turnings	24.50 to 25.50
Low phos. plate	47.00 to 48.00

Cleveland

No. 1 hvy. melting	$41.50 to $42.50
No. 2 hvy. melting	34.50 to 35.50
No. 1 dealer bundles	41.50 to 42.50
No. 1 factory bundles	47.00 to 48.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	42.50 to 43.50
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	22.00 to 23.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	22.00 to 23.00
Cut structural & plates, 2 ft & under	49.00 to 50.00
Drop forge flashings	41.50 to 42.50
Low phos. punch'gs plate	48.00 to 49.00
Foundry steel, 2 ft & under	41.00 to 42.00
No. 1 RR hvy. melting	46.50 to 47.50
Rails 2 ft and under	60.00 to 61.00
Rails 18 in. and under	61.00 to 62.00
Steel axle turnings	24.00 to 25.00
Railroad cast.	58.00 to 59.00
No. 1 machinery cast.	56.00 to 57.00
Stove plate	51.00 to 52.00
Malleable	67.00 to 68.00
Stainless	
18-8 bundles	225.00 to 235.00
18-8 turnings	115.00 to 120.00
430 bundles	120.00 to 125.00

Buffalo

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 busheling	36.00 to 37.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	18.00 to 19.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	18.00 to 19.00
Low phos. plate	41.00 to 42.00
Structurals and plate, 2 ft and under	42.00 to 43.00
Scrap rails, random lgth.	40.00 to 41.00
Rails 2 ft and under	50.00 to 51.00
No. 1 machinery cast.	51.00 to 52.00
No. 1 cupola cast.	47.00 to 48.00

St. Louis

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	43.00 to 44.00
No. 2 bundles	26.00 to 27.00
Machine shop turn.	19.00 to 20.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	24.00 to 25.00
No. 1 RR hvy. melting	48.00 to 49.00
Rails, random lengths	50.00 to 51.00
Rails, 18 in. and under	55.00 to 56.00
Angles and splice bars	50.00 to 51.00
RR specialties	49.00 to 50.00
Cupola cast.	55.00 to 56.00
Heavy breakable cast.	44.00 to 45.00
Stove plate	46.00 to 47.00
Cast iron car wheels	47.00 to 48.00
Rerolling rails	65.00 to 66.00
Unstripped motor blocks	45.00 to 46.00

Birmingham

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	35.00 to 36.00
No. 1 special bundles	38.00 to 39.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	40.00 to 41.00
Machine shop turn.	24.00 to 25.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	14.00 to 15.00
Electric furnace bundles	40.00 to 41.00
Elec. furnace, 3 ft & under	38.00 to 39.00
Bar crops and plate	45.00 to 46.00
Structural and plate, 2 ft.	44.00 to 45.00
No. 1 RR hvy. melting	39.00 to 40.00
Scrap rails, random lgth.	47.00 to 48.00
Rails, 18 in. and under	52.00 to 53.00
Angles and splice bars	45.00 to 46.00
Rerolling rails	63.00 to 64.00
No. 1 cupola cast.	53.00 to 54.00
Stove plate	53.00 to 54.00
Cast iron car wheels	43.00 to 44.00
Unstripped motor blocks	41.00 to 42.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	29.00 to 30.00
No. 2 dealer bundles	22.00 to 23.00
Machine shop turnings	8.00 to 9.00
Mixed bor. and turn.	10.00 to 11.00
Shoveling turnings	12.00 to 13.00
Clean cast. chem. borings	25.00 to 26.00
No. 1 machinery cast.	39.00 to 40.00
Mixed yard cast.	37.00 to 38.00
Heavy breakable cast.	34.00 to 35.00
Stainless	
18-8 prepared solids	195.00 to 200.00
18-8 turnings	85.00 to 90.00
430 prepared solids	85.00 to 90.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	39.00 to 40.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	36.00 to 37.00
Drop forge flashings	37.00 to 38.00
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Heavy breakable cast.	38.00 to 39.00
Mixed cupola cast.	47.00 to 48.00
Automotive cast.	52.00 to 53.00
Stainless	
18-8 bundles and solids	190.00 to 200.00
18-8 turnings	80.00 to 90.00
430 bundles and solids	85.00 to 95.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	23.00 to 24.00
No. 1 dealer bundles	32.00 to 33.00
No. 2 bundles	16.00 to 17.00
No. 1 busheling	32.00 to 33.00
Machine shop turn.	11.00 to 12.00
Shoveling turnings	13.00 to 14.00
Clean cast. chem. borings	18.50 to 19.50
No. 1 machinery cast.	40.00 to 41.00
Mixed cupola cast.	37.00 to 38.00
Heavy breakable cast.	34.00 to 35.00

San Francisco

No. 1 hvy. melting	$36.00
No. 2 hvy. melting	33.00
No. 1 dealer bundles	33.00
No. 2 bundles	22.00
Machine shop turn.	17.00
Cast iron borings	17.00
No. 1 cupola cast.	47.00

Los Angeles

No. 1 hvy. melting	$38.00
No. 2 hvy. melting	36.00
No. 1 dealer bundles	33.00
No. 2 bundles	20.00
Machine shop turn.	16.00
Shoveling turnings	18.00
Cast iron borings	18.00
Elec. furn. 1 ft and under (foundry)	$47.00 to 48.00
No. 1 cupola cast.	47.00

Seattle

No. 1 hvy. melting	$35.00
No. 2 hvy. melting	33.00
No. 2 bundles	22.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$32.25
No. 2 hvy. melting	28.25
No. 1 dealer bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Bush., new fact., prep'd	32.25
Bush., new fact., unprep'd	26.25
Machine shop turn.	14.00
Short steel turn.	17.00
Mixed bor. and turn.	13.00
Rails, rerolling	37.00
Cast scrap	$46.50 to 48.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	31.00
No. 2 bundles	20.00
Machine shop turn.	16.00
Shoveling turnings	20.00
Cut structural plate 2 ft & under	$47.50 to 48.50
Unstripped motor blocks	39.50 to 40.50
Cupola cast.	46.00 to 47.00
Heavy breakable cast.	34.00 to 35.00

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THE SIZE
OF YOUR FURNACE
OR THE
MANNER OF
CHARGING—
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Will Aluminum Wage Talks Be Reopened?

With contract extensions running out, and steel hopelessly deadlocked, both sides are having another look.

There is strong pressure in both directions.

■ The aluminum labor situation is becoming an open issue again.

The unions and the companies closed it late in July when they agreed to extend contracts until 30 days after the steel settlement or Nov. 1, which ever came first. It is now obvious Nov. 1 will come first.

There is no automatic strike scheduled at that time. Either party can terminate a contract on 10 days notice.

Another Look—But the pressure has been building up on several fronts so that all key people are taking another look.

Aluminum Co. of America had a meeting scheduled last week with the United Steelworkers of America, major union in the industry. But the Steelworkers asked for a postponement because they had more immediate problems pressing.

One spokesman for an aluminum producer believes the chances that aluminum might settle independently of steel would be brighter if steel workers strike again after the Taft-Hartley cooling off period.

Strike Possibility—On the other hand some suggest that if T-H doesn't bring a settlement in the steel industry, the USW high command might call its aluminum workers out along with steel to strengthen its hand.

One factor that would simplify things if the aluminum industry and USW decide to try for a settlement: Right to manage is not an issue in aluminum.

A complicating factor: Latest Dept. of Labor figures, July 1959, put the average hourly wage in the steel industry at $3.10, and in aluminum at $2.92. USW might try to make some of this up this year.

Cost of Settlement — Another factor producers must consider: Settlement will be retroactive to August 1. Workers are certain to get some wage and benefit hikes. So, producers have higher costs on the metal they are producing and selling now, though their books don't show it yet.

Earlier in the year producers made an issue of their sagging profit margins. They had the industry about conditioned for a price hike. The market has softened in the last few months. But many observers say it is the muddled economic picture more than soft markets that is holding the current aluminum price.

If the aluminum industry and its major unions decide to try for a settlement it won't take long. The companies have been in constant contact with both USW and AWI on local levels. Many local and non-economic issues have been pretty well hammered out.

Copper

Copper consumers apparently aren't worried about their stocks of metal. At least they haven't had to dip into inventories they started the year with.

That's the opinion of one copper man. Here's his reason:

Most copper users keep inventory books in the LIFO (last-in-first-out) method, he explains. That means they have metal they bought at the bottom of the market—25¢ per lb or less.

If they had to dip into this they would cover in a hurry on a futures market, almost at any price, rather than pay profit taxes on the basis of the cheaper copper. But on the Commodity Exchange in New York, and the London Metals Exchange, world's biggest futures markets, there is no substantial covering evident.

If consumers are counting on government metal to be released after the strikes are settled they're taking a chance. Government sources say the Treasury Dept. is ready to make a strong case against selling stockpile metal except in a clear emergency.

One possibility: There is some sentiment that copper will settle soon after Taft-Hartley is invoked against the steel industry rather than risk T-H being called against them.

Tin prices for the week: Oct.7—103.125; Oct. 8—102.75; Oct. 9—102.375; Oct. 13—102.125.*
*Estimate.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	24.70	24.00	8/1/59
Aluminum ingot	26.00	26.10	8/1/59
Copper (E)	30-31.50	30.00	9/9/59
Copper (CS)	33.00	30.00	9/1/59
Copper (L)	31.50	30.00	9/9/59
Lead, St. L.	12.80	11.80	8/24/59
Lead, N. Y.	13.00	12.00	8/24/59
Magnesium ingot	36.00	34.50	8/13/59
Magnesium pig	35.25	33.75	8/13/59
Nickel	74.00	64.50	12/8/58
Titanium sponge	160-160	162-182	8/1/59
Zinc, E. St. L.	12.00	11.00	9/22/59
Zinc, N. Y.	12.50	11.50	9/22/59

ALUMINUM: 99% Ingot COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. TIN: See above; Other primary prices, pg. 145.

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.032	.081	.136 .249	.250- 3.
1100, 3003	45.7	43.8	42.8	43.3
5052	53.1	48.4	46.9	46.0
6061-0	50.1	45.7	43.9	44.9

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6- 8	42.7-44.2	51.1-54.8
12-14	42.7-44.2	52.0-56.5
24-26	43.2-44.7	62.8-67.5
36-38	46.7-49.2	86.9-90.5

Screw Machine Stock—2011-T-3

Size"	¼	⅜-½	⅝-1	1¼-1½
Price	62.0	61.2	59.7	57.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.411	$1.884	$2.353	$2.823
.024 gage	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250- 2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting)..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	138	120	138
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	130	110	126
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	54.63	.....	52.86	55.82
Brass, Yellow	48.65	49.19	48.59	52.06
Brass, Low	51.48	52.02	51.42	54.79
Brass, R L	52.48	53.02	52.42	55.79
Brass, Naval	53.29	.....	47.10	56.70
Munts Metal	51.35	.....	46.66	.....
Comm. Bs.	53.92	54.46	53.86	56.98
Mang. Bs.	56.62	.....	50.28	.....
Phos. Bs. 5%	75.34	.....	75.84	.....

Free Cutting Brass Rod..... 33.86

TITANIUM

(Base prices, f.o.b. mill)

Sheet and strip, commercially pure, $7.25-$8.50; alloy, $12.40-$17.00. Plate, HR, commercially pure, $5.25-$6.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.75-$6.25; alloy, $7.75-$10.00; Bar, HR or forged, commercially pure, $4.25-$5.00; alloy, $4.25-$7.50; billets, HR, commercially pure, $3.55-$4.10; alloy, $3.55-$5.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 29.50
Beryllium Aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be.$43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots .....$ 2.25
Cadmium, del'd .....$ 1.40
Calcium, 99.9% small lots .....$ 4.55
Chromium, 99.8% metallic base....$ 1.31
Cobalt, 97-99% (per lb)....$1.75 to $1.82
Germanium, per gm, f.o.b. Miami, Okla., refined .....33.30 to 42.00
Gold, U. S. Treas., per troy oz.....$35.00
Indium, 99.9%, dollars per troy oz..$ 2.25
Iridium, dollars per troy oz.....$75 to $85
Lithium, 98% .....$11.00 to $14.00
Magnesium sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask f.o.b. New York .....$225 to $227
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz...$18 to $20
Platinum, dollars per troy oz...$77 to $80
Rhodium .....$120.00 to $125.00
Silver ingots (¢ per troy oz.).....91.375
Thorium, per kg. $43.00
Vanadium ..... $ 3.45
Zirconium sponge .....$ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 29.25
- No. 120 ..... 28.00
- No. 123 ..... 27.00

80-10-10 ingot
- No. 305 ..... 33.50
- No. 315 ..... 31.50

88-10-2 ingot
- No. 210 ..... 42.00
- No. 215 ..... 37.75
- No. 245 ..... 33.50

Yellow ingot
- No. 405 ..... 23.75

Manganese bronze
- No. 421 ..... 26.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 25.00-25.25
- 0.60 copper max. 24.75-25.00

Piston alloys (No. 132 type)..26.75-27.75
No. 12 alum. (No. 2 grade)...23.50-24.00
108 alloy 24.00-24.50
195 alloy 26.50-27.50
13 alloy (0.60 copper max.)...24.75-25.00
AX8-679 (1 pct zinc) 23.75-24.75

(Effective Oct. 12, 1959)

Steel deoxidizing aluminum notch bar granulated or shot
- Grade 1—95-97½% 24.00-25.00
- Grade 2—92-95% 22.75-23.75
- Grade 3—90-92% 21.75-22.75
- Grade 4—85-90% 21.25-22.25

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	27½	26¾
Yellow brass	20¾	18⅞
Red brass	24½	23½
Comm. bronze	25⅛	24⅛
Mang. bronze	19¾	18½
Free cutting rod ends.	19⅞	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 26¼
- No. 2 copper wire 24¾
- Light copper 22½
- *Refinery brass 24¼
- Copper bearing material 23¼

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 27
- No. 2 copper wire 24½
- Light copper 22½
- No. 1 composition 22
- No. 1 comp. turnings 21⅛
- Hvy. yellow brass solids 16
- Brass pipe 15½
- Radiators 16½

Aluminum

- Mixed old cast. ..... 14 —15
- Mixed new clips ..... 16½—17
- Mixed turnings, dry ..... 14½—15⅛

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

- No. 1 copper wire ..... 24¼—24½
- No. 2 copper wire ..... 22¼—22½
- Light copper ..... 20¼—20½
- Auto radiators (unsweated). 14 —14½
- No. 1 composition ..... 18½—19
- No. 1 composition turnings.. 17 —17½
- Cocks and faucets ..... 14¼—14¾
- Clean heavy yellow brass ... 12⅝—13⅛
- Brass pipe ..... 14¼—14⅝
- New soft brass clippings .... 14¾—15⅛
- No. 1 brass rod turnings .... 12 —12½

Aluminum

- Alum. pistons and struts .... 7½— 8
- Aluminum crankcase ..... 11⅛—11¾
- 1100 (2s) aluminum clippings 15 —15½
- Old sheet and utensils ..... 11¼—11¾
- Borings and turnings ..... 7 — 7½
- Industrial castings ..... 11¼—11¾
- 2020 (24S) clippings ..... 12½—13

Zinc

- New zinc clippings ..... 5½— 5¾
- Old zinc ..... 3¾— 4
- Zinc routings ..... 2½— 2½
- Old die cast scrap ..... 2¼— 2½

Nickel and Monel

- Pure nickel clippings 52-54
- Clean nickel turnings 40
- Nickel anodes 52-54
- Nickel rod ends 52-54
- New Monel clippings 30-32
- Clean Monel turnings 20-23
- Old sheet Monel 26-28
- Nickel silver clippings, mixed 18
- Nickel silver turnings, mixed 15

Lead

- Soft scrap lead ..... 8¾— 9¼
- Battery plates (dry) ..... 4¼— 4½
- Batteries, acid free ..... 2½— 2¾

Miscellaneous

- Block tin ..... 77 —78
- No. 1 pewter ..... 59 —60
- Auto babbitt ..... 40 —41
- Mixed common babbitt ..... 9¾—10¼
- Solder joints ..... 14 —14½
- Siphon tops 42
- Small foundry type ..... 10¼—10¾
- Monotype ..... 10¼—10¾
- Lino. and stereotype ..... 9¼— 9¾
- Electrotype ..... 7¾— 8¼
- Hand picked type shells .... 6 — 6½
- Lino. and stereo. dross ..... 2¾— 3¼
- Electro dross ..... 2¾— 3¼

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3, R3*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*		5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Bridgeport, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3,* $114.00 *T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.525 *A1,T8, M8*	7.575 *W8*		8.40 *W8, S9,I3*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1,P11*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 *S1;* *C10*	$119.00 *C10,S1*					5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3,B4* 7.525 *E3*			8.40 *S9*	15.55 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$90.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$100.00 *B2*	$130.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$100.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$100.00 *B2*			6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

(Effective Oct. 12, 1959)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* *1.25*-lb. base box	Electro** *0.25*-lb. base box	Holloware Enameling *29* ga.
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price, 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75 lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.325 *U1*			$10.50 *U1*	$9.20 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*			7.525 *B3*	9.275 *B3*	10.025 *B3*	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	
	Worcester, Mass.									6.70 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*						
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1, W8*			6.40 *A5, R3,W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3**	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3,Y1*	6.275 *U1, I3,Y1*	6.875 *U1, I3*	6.775 *U1, I3,Y1*	7.225 *U1*	7.525 *U1, Y1,I3*	9.275 *U1, Y1*		6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1,Y1*	7.85 *U1, Y1*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	7.95 *G2*
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3**	6.775 *S1*	7.225 *S1**, *R3*	7.525 *R3, S1*	9.275 *R3,*				$9.10 *R3*	
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 *U1, J3,P6*	6.275 *U1, J3,P6*	6.875 *U1, J3* 7.50 *E3**	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.025 *U1, J3*	6.40 *A5, J3,P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	7.85 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3,W5*	6.875 *W3, W3* 7.50 *W3**		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*			$10.40 *W5, W3*	$9.10 *W5, W3*	7.85 *W5*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*	7.50 *J3**	6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*			$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2,R3*	$10.50 *T2*	$9.20 *T2*	
	Houston, Texas									6.65 *S2*			

*Electrogalvanized sheets.

(Effective Oct. 12, 1959)

*7.425 at Sharon-Niles is 7.225

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.975 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *C4*		7.50 *C4*	7.95 *C4*	
	Centerville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Harrisburg, Pa.							5.30 *P2*	6.375 *P2*			
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Fairless, Pa.	5.825 *U1*	5.825 *U1*		6.875 *U1*							
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5, B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7, A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3* 6.475 *T5*	9.025 *R3,R2* 8.775 *T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875 *L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,I3, W8,N4 K2,W1*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C1*
	Detroit, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8,B5* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5* 9.225 *B5,P3, P8*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5.675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*					5.30 *N4*				8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,I3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.30 *W5*				
	Youngstown, Ohio	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, S12*	8.625 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				8.675 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2,A10*				8.675 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga.	5.875 *A8*	5.675 *A8*									8.00 *A8*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective Oct. 12, 1959) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Blias & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Chicago, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Steel Corp., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Youngstown *R3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fontana *K1*	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50								
Pittsburgh *J3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Alton, Ill. *L1*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Sharon *M3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fairless *N2*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Pittsburgh *N1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Wheeling *W5*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Wheatland *W4*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Youngstown *Y1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Indiana Harbor *Y1*	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50								
Lorain *N2*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Youngstown *R3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Fontana *K1*	*6.25		*2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Alton, Ill. *L1*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Sharon *M3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Wheeling *W5*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Indiana Harbor *Y1*	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50								
Lorain *N2*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.00¢ per lb.

(Effective Oct. 12, 1959)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium..					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*L4, C4, A3, J2*) 10 pct	Plate (*L4, C4, A3, J2*) 15 pct	Plate (*L4, C4, A3, J2*) 20 pct	Sheet (*I2*) 20 pct
Stainless Type	302	.....	.....	.....	37.50
	304	28.80	31.55	34.30	40.00
	316	42.20	46.25	50.25	58.75
	321	34.50	37.75	41.05	47.25
	347	40.80	44.65	48.55	57.00
	405	24.60	26.90	29.25	.....
	410	22.70	24.85	27.00	.....
	430	23.45	25.65	27.90	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 42.50; 1 side, 35.85.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.75	6.725	7.25	.....	.....	.....
Cleveland *R3*	.....	.....	.....	10.10	.....	15.35
So. Chicago *R3*	.....	.....	.....	.....	.....	.....
Ensley *T2*	5.75	6.725	.....	10.10	6.875	.....
Fairfield *T2*	.....	6.725	.....	.....	6.875	.....
Gary *U1*	5.75	.....	.....	10.10	.....	.....
Huntington, *C16*	.....	6.725	.....	.....	.....	.....
Ind. Harbor *I3*	.....	.....	.....	10.10	.....	.....
Johnstown *B3*	.....	6.725	.....	.....	.....	.....
Joliet *U1*	.....	.....	7.25	.....	.....	.....
Kansas City *S2*	.....	.....	.....	10.10	.....	15.35
Lackawanna *B3*	5.75	6.725	7.25	.....	6.875	.....
Lebanon *B3*	.....	.....	7.25	.....	.....	15.35
Minnequa *C6*	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh *P5*	.....	.....	.....	.....	.....	14.75
Pittsburgh *J3*	.....	.....	.....	10.10	.....	.....
Seattle *B2*	.....	.....	.....	.....	6.75	15.85
Steelton *B3*	5.75	.....	7.25	.....	6.875	.....
Struthers *Y1*	.....	.....	.....	10.10	.....	.....
Torrance *C7*	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.725	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	10.10	.....	.....

COKE

	Net-Ton
Furnace, beehive (f.o.b.) Connellsville, Pa.	$14.50 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Detroit f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearney, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	34.35
Erie, Pa., f.o.b.	32.00
Cleveland, del'd	34.19
Cincinnati, del'd	32.84
St. Paul, f.o.b.	31.25
St. Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1959 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field	.....	9.875	.....
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor	.....	12.475	.....
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30	Grain Oriented	
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Aliquippa (*J3*); Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S7*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	27.25	40	100,110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

Super duty, Mo., Pa., Md., Ky.	$185.00
High duty (except Salina, Pa., add $5.00)	140.00
Medium duty	125.00
Low duty (except Salina, Pa., add $2.00)	103.00
Ground fire clay, net ton, bulk	22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$158.00
Childs, Hays, Latrobe, Pa.	163.00
Chicago District	168.00
Western Utah	183.00
California	165.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	163.00-168.00
Silica cement, net ton, bulk, Latrobe	29.75
Silica cement, net ton, bulk, Chicago	26.75
Silica cement, net ton, bulk, Ensley, Ala.	27.75
Silica cement, net ton, bulk, Mt. Union	25.75
Silica cement, net ton, bulk, Utah and Calif.	39.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$109.00
Standard chemically bonded, Curtiner, Calif.	119.00
Burned, Balt.	103.00

Magnesite Brick

Standard, Baltimore	$140.00
Chemically bonded, Baltimore	119.00

Grain Magnesite

St. ⅜ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk.	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$16.75
Missouri Valley	15.60
Midwest	17.00

(Effective Oct. 12, 1959)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3***	173	190	...	...	190	9.00	9.675
Atlanta *A8***	175	192	...	214	198	8.75	9.425
Bartonville *K2***	175	192	178	214	198	9.10	9.775
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4***	177	190	172	212	196	9.00	9.70
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dsv. *M4***	175	192	...	214	198	9.10	9.775
Donora, Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	...	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	184-1	197	...	219	203	9.10	9.775
Johnstown *B3***.	173	190	17.	...	196	9.00	9.675
Joliet, Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9*	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2*.	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Monessen *P6*	.....	.....	.....	.....	193	8.65	9.325
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	...	...	213	9.60	10.15
Rankin, Pa. *A5*	173	187	...	...	193	9.00	9.55
So. Chicago *R3*	173	187	...	...	193	8.65	9.20
S. San Fran. *C6*	.....	.....	.....	236	.....	9.95	10.50†
SparrowsPt. *B3***	175	.....	.....	214	198	9.10	9.775
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.20
Worcester *A5*	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 11-12¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Anderson, Ind. *G4*	8.95	10.40	12.60	15.60	18.55
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Chicago	.....	.....	.....	15.60	.....
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	.....	.....
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *R5*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Britain, Conn. *S7*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.85
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *R5*	9.10	10.55	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.50
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
National Tube	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.50
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
Pittsburgh Steel	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
	4	10	97.08	113.80	.....

METAL POWDERS

Cents per lb, minimum truckload, delivered E. of Miss. River, unless otherwise noted.

Iron Powders

Compacting Powders

Electrolytic, imported, f.o.b.	29.50 to 33.00
Electrolytic, domestic	34.50
Sponge	11.25
Atomized	11.25
Hydrogen Reduced	11.25 to 12.00
Carbonyl	88.00
Welding Powders*	8.10
Cutting and Scarfing Powders*	9.10

Copper Powders

Electrolytic, domestic	41.00
Precipitated	40.50 to 45.00
Atomized	39.80 to 48.30
Hydrogen reduced, f.o.b.	43.25
Bronze	47.20 to 51.50
Chromium, electrolytic	$5.00
Lead	19.00
Manganese, f.o.b.	42.00
Molybdenum	$3.60 to $3.95
Nickel	$1.05 to $1.03
Nickel Silver	53.50
Nickel Steel	13.00
Solder	13¢ plus metal value
Stainless Steel, 302	$1.07
Stainless Steel, 316	$1.26
Steel, atomized, prealloyed, 4600 series	14.00 plus metal value
Tin	14¢ plus metal value
Titanium, 99.25+%, per lb., f.o.b.	$11.25
Tungsten	$3.15 (nominal)

* F.O.B., shipping point.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Bolts	1-4 Containers	5 Containers	20,000 Lb.	40,000 Lb.
Machine				
½" and smaller x 3" and shorter	55	57	61	62
⅝" diam. x 3" and shorter	47	49½	54	55
¾" thru 1" diam x 6" and shorter	37	39½	45	46
¾" thru 1" diam. longer than 6" and 1½" and larger x all lengths	31	34	40	41
Rolled thread, ¼" and smaller x 3" and shorter	55	57	61	62
Carriage, lag, plow, tap, blank, step, elevator and fitting up bolts ½" and smaller x 6" and shorter	48	50½	55	56

Note: Add 25 pct for less than container quantity. Distributor prices are 5 pct less on bolts and square nuts.

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½

C. P. Hex, reg. & hvy.

¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½

Hot Galv. Hex Nuts (All Types)

¾ in. and smaller	41

Semi-finished Hex Nuts

¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½

(Add 25 pct for broken case or keg quantities)

Finished

⅞ in. and smaller	65

Rivets

Base per 100 lb

½ in. and larger	$12.85

Pct. Off List

7/16 in. and smaller	15

Cap Screws

Discount (Packages)

Full Finished H. C. Heat Treat

New std. hex head, packaged	Full Case
⅝" diam. and smaller x 6" and shorter	54
¾", ⅞", and 1" diam. x 6" and shorter	38
⅝" diam. and smaller x longer than 6"	..
¾", ⅞", and 1" diam. x longer than 6"	..

	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	59	48
¾" through 1" dia. x 6" and shorter	45	32

Minimum quantity—¼" through ⅜" diam., 15,000 pieces; 7/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

	Discount Mach. Screws	Stove Bolts
Plain Finish Cartons	60	60
Bulk		
Quantity		
To ¼" diam. incl. 25,000-and over	60	..
5/16 to ½" diam. incl. 15,000-200,000	60	..

Machine Screws & Stove Bolt Nuts

	Discount Hex	Square
In Cartons	16	19
Quantity		
In Bulk ⅜" diam. & smaller 25,000-and over	15	16

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	44.50
Electrodeposited	36.00
Brass, 80-20, ball anodes, 2000 lb or more	51.50
Zinc, ball anodes, 2000 lb lots	16.00
(for elliptical add 1¢ per lb)	
Nickel, 99 pct plus, rolled carton, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium, 5000 lb	1.20
Tin, ball anodes $1.05 per lb (approx.).	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	65.90
Copper sulphate, 100 lb bags, per cwt.	22.75
Nickel salts, single, 100 lb bags	36.00
Nickel chloride, freight allowed, 100 lb	45.00
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	24.70
(Philadelphia price 25.00)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum N. Y.	45.50
Chromic acid, flake type, 10,000 lb or more	30.44

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.5
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

STEEL SERVICE CENTERS

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.91	9.29	9.40	9.39	13.24				
Baltimore	$.10	8.65	9.35	9.09	9.15	9.10	9.65	9.55	11.80	16.28	15.28	19.82	19.84
Birmingham		8.18	9.45	10.46	8.51	8.89	9.00	8.99					
Boston**	.10	10.52	11.27	11.82	12.17	10.42	10.72	10.34	13.45	17.69	16.69	21.79	21.84
Buffalo**	.15	9.80	10.50	11.35	11.30	10.25	10.40	9.90	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	8.69	10.35	11.05	10.35	8.62	9.16	8.79	10.80	17.10	16.10	19.70	20.45
Cincinnati**	.15	8.86	10.41	11.10	10.67	9.00	9.84	9.11	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	8.69[1]	9.89	11.02	10.47	8.88	9.67	8.90	11.40	17.21	16.21	21.31	20.56
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19				20.84
Detroit**	.15	8.95	10.61	11.40	10.72	8.99	9.84	9.10	11.16	17.38	16.38	21.48	21.03
Houston		8.10	8.60		8.15	8.45	8.05	8.10	11.60	16.20	15.25	19.65	18.95
Kansas City	.15	9.02	10.27	11.37	9.33	9.71	9.82	9.81	10.22	16.87	15.87	20.37	19.62
Los Angeles**		9.95[1]	11.55	12.20	11.55	10.00	10.00	9.10	14.20	18.30	16.45	21.30	20.80
Memphis	.15	8.55	9.80		8.60	8.93	9.01	8.97	12.11				
Milwaukee**	.15	8.83	10.49	11.19	10.49	8.76	9.30	8.93	11.04	17.24	15.34	21.24	19.09
New York**	.10	10.52	10.59	11.40	12.14	10.77	10.84	10.09	13.35	17.50	16.50	21.60	20.85
Norfolk	.20	8.20			8.90	8.65	9.20	8.90	10.70				
Philadelphia	.10	8.30	9.35	10.71	9.35	9.25	9.20	9.50	12.05	16.58	15.58	20.08	19.33
Pittsburgh**	.15	8.69	9.84	10.91	10.45	8.62	9.78	8.79	11.40	17.10	16.10	19.70	20.45
Portland		10.00	11.75	13.30	11.95	11.50	11.10	9.85	15.30	18.50	17.45	20.75	20.25
San Francisco**	.10	11.00	11.95[2]	11.50	12.25	11.00	10.95	10.75	15.20	18.30	16.35	22.90	20.60
Seattle**		11.55	12.30	12.50	12.65	11.00	10.20	11.10	16.20	18.60	17.60	22.70	22.20
Spokane**	.15	11.70	12.45	12.65	13.30	11.15	11.35	11.75	16.35	17.75	17.95	21.58	22.35
St. Louis**	.15	9.07	10.73	11.02	10.73	9.00	9.76	9.17	11.43	17.48	16.48	21.58	19.33
St. Paul	.15	8.94	9.31	10.47	8.99	9.45	9.53	9.76	11.49		15.41		20.83

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** These cities are on net pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—⅝-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅝" to 2⅞"; cold drawn—15/16" to 2⅛" round; Hot-rolled 4140—⅝" to 2⅞" round, cold drawn—15/16" to 2⅛" round.

†† 10¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter.

(Effective Oct. 12, 1959)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	.....
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	.....
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50	.....	.....
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.00	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	.....
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1, I4* (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.); $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	28.00	31.50	29.00	32.75	33.25	34.50	51.25	41.50	48.25	—	22.25	—	22.50
Billets, forging	—	37.75	38.75	39.50	42.50	42.00	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	49.50	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25-31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R5;* Harrison, N. J., *D3;* Youngstown, *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7,* Wallingford, Conn., *U5* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1,* (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8.*

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Ambridge, Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa , *C2.*

(Effective Oct. 12, 1959)

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Established 1909

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C....	41.00	0.50% C....	38.00
0.05% C....	39.00	1.00% C....	37.75
0.10% C....	38.50	1.50% C....	37.50
0.20% C....	38.25	2.00% C....	37.25

4.00-4.50% C, 60-70% Cr, 1-2% Si.. 37.25
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 28.25
0.025% C (Simplex) 39.75
8% max C, 50-55% Cr, 6% max Si. 25.75
4½% max C, 50-55% Cr, 2% max Si 26.50

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97.25% min. Cr, 1% max. Fe.

0.10% max. C	$1.29
9 to 11% C, 88-91% Cr, 0.75% Fe...	1.38

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.15
Ton lots	1.17
Less ton lots	1.19

Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads, bulk	28.25	14.60
Ton lots	33.50	16.05
Less ton lots	35.10	17.70

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads, bulk	24.00
Ton lots	27.95
Less ton lots	29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads, bulk	23.00
Ton lots	26.15
Less ton lots	27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ⅛ in. x 12 mesh.

Ton lots	21.15
Less ton lots	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	18.45
Ton lots	19.95
Less ton lots	21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload bulk	19.20
Ton lots to carload packed	21.15
Less ton lots	22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn. Carload lots, bulk.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Neville Island, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	14.80
Ton lots packed in bags	17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	34.00
Ton lots	36.00
250 to 1999 lb	38.00
Premium for Hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% (Bulk) P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk	12.80
Ton lots, packed	14.45
Carloads, bulk, delivered, per lb of briquet	15.10
Briquets, packed pallets, 2000 lb up to carloads	17.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots,	Carloads,
98.25% Si, 0.50% Fe..	22.45	21.25
98% Si, 1.0% Fe	21.95	20.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk	8.00
Ton lots, packed	10.80

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	14.60	75% Si....	16.90
65% Si....	15.75	85% Si....	18.60
		90% Si....	20.00

Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.

Openhearth	3.20
Crucible	3.30
High speed steel	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
100 to 1999 lb..	2.40	3.30	4.55

(Effective Oct. 12, 1959)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads, bulk	9.85¢
Ton lots	11.20¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.50

Ferrocolumbium, 58-62% Cb, 2 in. x D, delivered per pound

Ton lots	$3.45
Less ton lots	3.50

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Cb plus Ta $3.40

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.76

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $5.00 unitage, per gross ton $120.00
10 tons to less carload $131.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $255.00

Ferrotungsten, ¼ x down packed, per pounds contained W, ton lots delivered ..... $2.15 (nominal)

Molybdic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa. $1.49
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 .... $1.38

Zirconium silicon, per lb of alloy 35-40% del'd, carloads, bulk.. 26.25¢
12-15%, del'd lump, bulk-carloads ..... 9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload $5.50

Ferro Zirconium Boron, Zr 50% to 60%, B 0.8% to 1.0%, Si 8% max., C 8% max., Fe balance, f.o.b. Niagara Falls, New York, freight allowed, in any quantity per pound ..... 30¢

Corbortinm, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 18.25¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots .. $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 19%	1.20
19% min. B	1.50

Grainal, f.o.b. Cambridge, O., freight allowed, 100 lb and over

No. 1	$1.05
No. 79	50¢

Manganese-Boron, 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots (packed)	$1.46
Less ton lots (packed)	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

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(1)—S. & S. 5-unit set consists of—(1) 2500-HP syn. motor, 11000/4160-V, 3 ph., 60 cy., (1) 1060-KW Gen. 600-BDC, (2) 760-KW Gen. 600-VDC, (1) exciter gen. (Will split this set to fit your requirements.)

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(1)—1875-KW Whse. 2-unit set—(1) 250-VDC gen., (1) 2700-HP syn. motor, 13800/6900/-4160-V., 3 ph., 60 cy.

(1)—1250-KW Gen., Elec. 2-unit set—(1) 132/265-BDC gen., (1) 1750-HP syn. motor, 4160-V., 3 ph., 60 cy.

(1)—850-KW Gen. Elec. 2-unit set—(1) 250/300-VDC gen., (1) 1250-HP syn. motor, 13800/-6900/4160-V., 3 ph., 60 cy.

MOTORS

(1)—2200 H.P. Westinghouse motor, 600 BDC., 92/132 R. P. M.

(2)—600 HP, Allis Chalmers motors, 600 VDC, 300/600 R.P.M.

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Pittsburgh Dealers Report Few Sales

Used machine sales in the Pittsburgh area have come to a virtual stand-still.

Dealers are waiting for the steel strike to end before they can start moving equipment.

■ The steel strike has dried up business for Pittsburgh dealers. Both inquiries and orders are off. Most customers are either on strike or are cutting back for lack of steel.

Even those plants still operating are marking time. Most district plants are tied to the basic steel wage pattern. Labor contracts of many call for wage increases in steel to be applied retroactively. With costs unknown and business uncertain, no one is in a mood to spend money.

Little Buyer Interest — Directly affected by the strike are suppliers of steel mill equipment. "There is little interest among buyers," says one dealer, "and if there was, you couldn't get in the mills to look at equipment."

In general machinery lines, business is not much better. One dealer reports sales of a table type boring mill and general toolroom equipment. But for the most part, orders are from the South and other points outside the district.

"The big fabricators are on strike or don't have steel," says the dealer. Most types of equipment are plentiful. Prices are stable but the lack of buyer interest has left dealers with little occasion for price cutting.

Electrical Equipment—Suppliers of electrical equipment have shipped some big motors to mills during the strike. These have gone to construction sites rather than to operating plants. Electrical men have received orders for transformers to be shipped to steel mills after the strike.

In recent weeks, however, inquiries by mills for electrical equipment have fallen off sharply. The feeling is there will be little new business before the labor settlement in steel. One dealer feels it will take a good eight weeks of normal operations before orders improve.

Outside the steel industry, electrical suppliers report a modest demand for compressors and horizontal motors.

Few Sales—In the materials handling field, a slightly different story is reported. Current business is slow and is limited to the lighter types of equipment. However, steel mills have started to put out inquiries on overhead cranes and heavy winches.

Fabricating shops are being cautious about spending, says a supplier of materials handling equipment. "They don't know how much labor costs will go up when the steel agreement is reached."

Supplies of materials handling equipment are holding up. Prices show no great change, there have been adjustments up and down, but no general trend.

The Market Mood—The general mood of the market is summed up by one dealer:

"You picked the wrong place to ask about business," he said.

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No. 1 Pines Hydraulic, Capacity 1 x 16 Ga. Tube
BENDING ROLLS
13' x 3/16" Bertsch Initial Type—New 1957
32' x ⅝" Baldwin Pyramid Type—New 1942
BRAKES—PRESS TYPE
90 ton Niagara, Model 90-8-10
16' x 10 Ga. Clearing
18' x ⅝" Southwark 800 ton
CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton P&H	40' Span	220 Volt D.C.
10 ton P&H	55' Span	220/3/60
10 ton P&H	59' Span	230 Volt D.C.
10 ton Milwaukee	57' Span	230 Volt D.C.
10 ton Whiting	75' Span	220/3/60 A.C.
10 ton Shaw	120' Span	230 Volt D.C.
15 ton Milwaukee	50' Span	440/3/60 A.C.
15 ton Shepard Niles	53' 6" Span	220/3/60
20 ton P&H	57' 6" Span	220/3/60
30 ton Shaw	70' Span	230 Volt D.C.
120 ton Niles	67' Span	230 Volt D.C.
120 ton Shepard Niles	77' Span	220/3/60 A.C.

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ACS Yoder Cutoff with dies for ⅜, ½, ⅝, ¾, ⅞, 1, 1¼ and 1¾" tubing
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Detrex Vapor Degreaser 41'6"L x 4'6"W x 8' Deep 800 Gal Storage Tank, Detrex Solvent Still
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7,000 lb. Draw Bench,	51 ft. Draw
10,000 lb. Draw Bench,	50 ft. Draw
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⅝" Blue Valley No. 4
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60" Guide 17 Rolls 4½" Dia.
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No. 35 U. S. Multi-Slide, Max width of stock 4½" x .089 thick, length of feed 12½"
NIBBLER
Pullmax Model 2, Capacity 11/32"
PRESSES—HYDRAULIC
250 ton Southwark Platen 28" x 28", Stroke 35"
500 ton Watson Stillman Piercing Press, 48" x 72"
1000 ton Southwark Bed 44" x 54", Stroke 20"
4500 ton B-L-H Bed 68"x68", Stroke 40"
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Coper & Notcher, Punch 1"x1¼", Shear 2½" Rd. 2" Sq.
#2½ Buffalo Ironworker
Cleveland Style W, 60" Throat, 312 Ton Capy. Complete with dishing att. punches, shear blades
#6½ x 30 U. D. Buffalo Punch, Shear, Bar Cutter. Punch 1½ x 1½; Shear 3" Rd., 2½" Sq., 6 x 6 x ⅝" Angles
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3¼" x 7" Six Cluster Mill
10" x 10" Single Stand Two High
10" x 14" Single Stand Two High
12" x 16" Single Stand Two High
16" x 24" Two Stand Two High
26" x 60" Single Stand Two High
12" x 32" Birdsboro 3-Hi Bar Mill
22" x 40" Lewis 3-Hi Sheet Mill
32" x 84" Single Stand Three High
34" x 112" Single Stand Three High
ROLLS—PLATE STRAIGHTENING
72" McKay 9 Rolls 15" Dia. Backed-up
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SHEAR—BEAM
Pels DT-36-B Armor Plate, Capy 15" beams & channels, 6" x 6" x ⅝" angles
SHEAR—GATE
8' x 1" Wood Hydraulic
SHEARS, MISC.
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84" x 3/16" United Up-Cut, 50 H.P. A.C. Motor Drive
SHEARS—ROTARY
No. 23A Quickwork Whiting 3/16 Capacity
No. 40A Quickwork Whiting ⅜" Capacity
SHEARS—SQUARING
6' x 14 Ga. Edwards, Motor Drive—LATE
10' x ¼" United
10' x ⅜" Niagara No. 910
SLITTERS
36" Waterbury Farrel, Slitting Line, Arbor 4½" Dia.
STRAIGHTENERS
Torrington #1734 12-Roll, Cap. 1¾", Rd. 1-9/16"
#1 Medart Rotary, Capy. ⅛ to 2½ Rd.
SWAGING MACHINE
#6½A Fenn 3-Die, Capacity 3¾" Tube, 1¼" Solid 10" Die Length, Hydraulic Feed
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60,000 lb. Universal Hydraulic
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3—6'-17" Col. American Radial Drills, Serial Nos. 51935 and 43529. Main Drive motors 10 HP., 230 volt D.C.

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1—7½ Ton SHAW O.E.T. CRANE, cab operated, Serial 2416, 3½ ton auxiliary hoist, lift 34'-1", span 40'-0¾", 4 motors, 230 volt D. C.

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1	600	Whse.	CW-4-22D-13	440	1770
1	500	G.E.	MT-412	2200	428
1	500	Whse.	CW	550	350
1	300	G.E.	MTP-561	2300	1800
1	200	G.E.	IM 440/2200		589
1	125	G.E. unused	MT-557	220/440	1200
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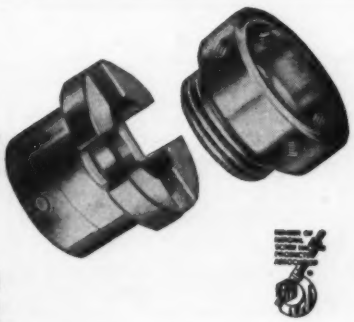

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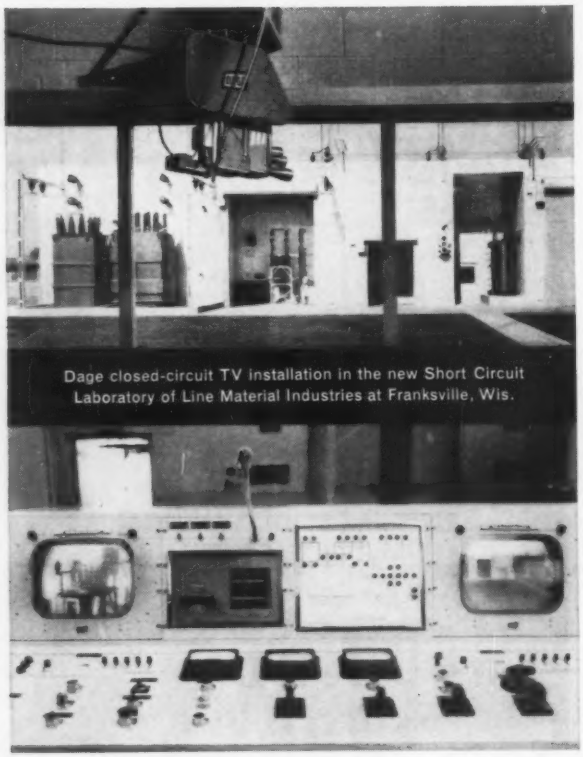

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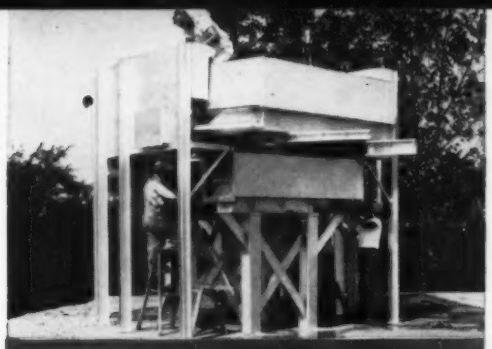
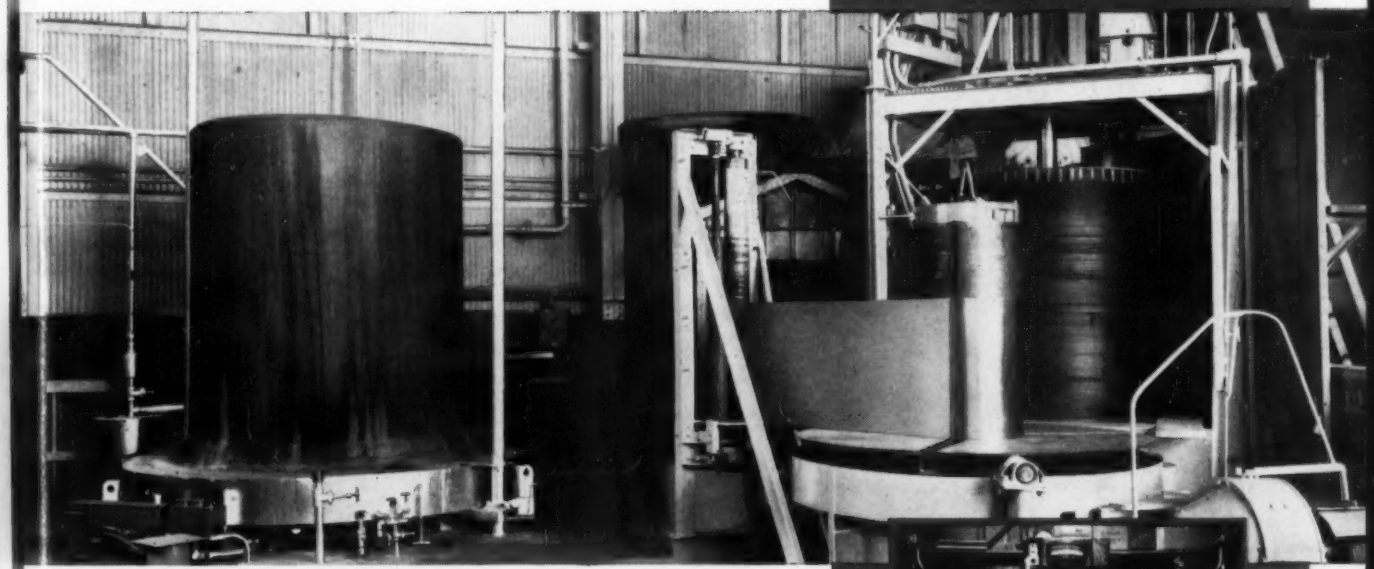
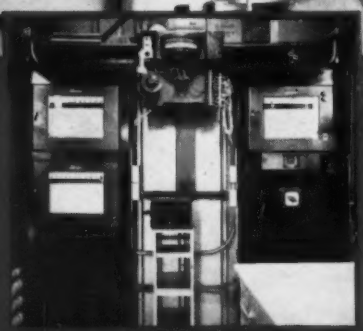


Full-scale wooden mock-up of two sections of the eight-zone new Lee Wilson Rotary Opened Coil Annealing Furnace enables Lee Wilson engineers to study design and construction details.



Typical scene at Lee Wilson Research Center shows test coil (on the right) being tight-wound for temper rolling after annealing; on the left, an inner cover over a test charge being purged.



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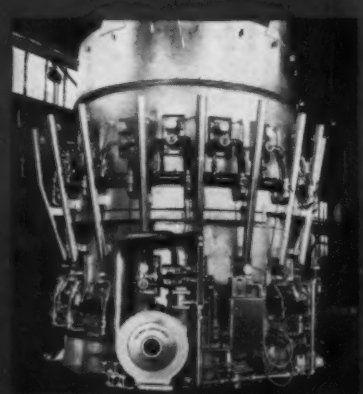

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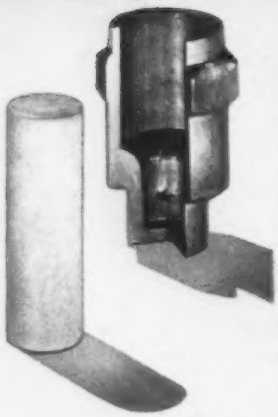

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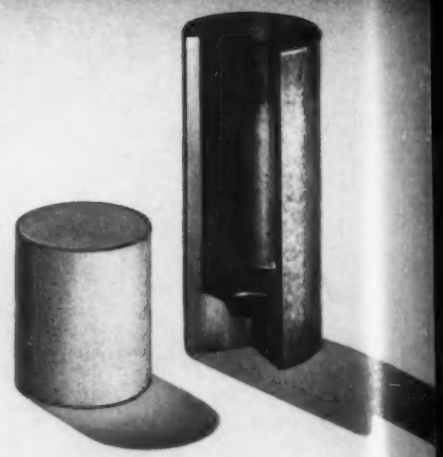
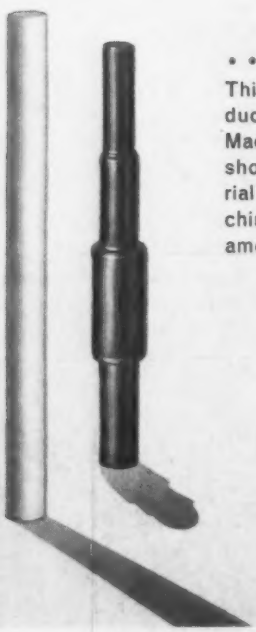
Manufacture of this automotive sparkplug shell by the Verson Impact Machining Process cuts material consumption by 65% over conventional machining by metal removal. With Impact Machining the shell is made from the slug shown rather than from more expensive hexagonal bar stock.

. . . By 57%?

By Impact Machining this automotive valve tappet body from the slug shown, 57% less metal is required than when the part is machined by metal removal processes. Savings amount to 250 pounds per 1000 pieces.



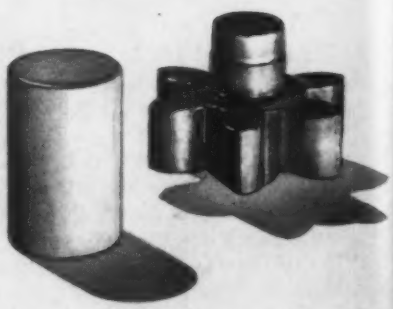


. . . By 70%?

This worm shaft is produced by Verson Impact Machining from the slug shown. Savings in material over conventional machining by metal removal amount to 70%.

. . . By 75%?

In the production of rotor gears by Verson Impact Machining material consumption is reduced by 75% from metal removal processes. The gear is made from the slug shown.



• Substantial reduction in material consumption is only one advantage of Impact Machining. Write for descriptive literature outlining the additional advantages of reductions in raw material cost, machining requirements and materials handling.

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